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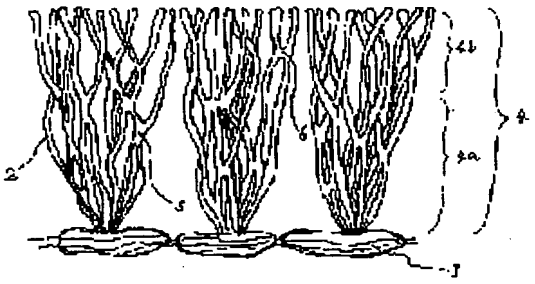
(54) FIBER STRUCTURE FOR COATING TOOL AND METHOD OF PRODUCING THE SAME

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a fiber structure for coating tool that has excellent paint absorption (paint retention), outflow properties (paint discharge) and paint- finishing properties as well as a coating tool utilizing the fiber structure.
SOLUTION: The objective fiber structure for coating tools has (A) an upright fiber layer (pile) including 30-100 mass % of hot melting crimped fiber with crimp elongation of 5-30% on one face and the network hot-melting layer formed by partially fusing the hot-melting crimped fibers in the inside of the upright fiber layer and has the bulky layer on the surface of the outside. In another embodiment, the objective fiber structure for coating tools comprises (B) an upright fiber layer (pile) including 30-100 mass % of hot melting crimped fiber with crimp elongation of 5-30% on one face and the porous skin layer of 100-1,000 □m thickness formed by partially fusing the hot-melting crimped fibers on the surface of the upright fiber layer. The fiber structures for coating tool (A) or (B) used to make coating tools, for example, paint roller, trowel brush and the like.



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[Claim(s)]

[Claim 1] It has a set-up fiber layer on one side of ground weave, and this set-up fiber layer consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass %. This set-up fiber layer The fiber structure object for paint implements characterized by making the nothing bulky layer with the bulky lateral part of the upper part of this reticulated welding layer for the reticulated welding layer in which the inside part was formed of the partial welding of said thermal melting arrival nature crimped staple.

[Claim 2] The fiber structure object for paint implements according to claim 1 whose ratios of [thickness of reticulated welding layer]: [thickness of a bulky layer] the height of a set-up fiber layer is 3-20mm, and are 9:1-1:9.

[Claim 3] The fiber structure object for paint implements according to claim 1 or 2 whose water retention ability of a reticulated welding layer is 4 to 16 times the fiber mass which forms the reticulated welding layer.

[Claim 4] It is the fiber structure object for paint implements characterized by to make the porosity skin with a thickness [by the welding of said thermal-melting arrival nature crimped staple with which it has a set-up fiber layer on one side of ground weave, this set-up fiber layer consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass %, and the surface part of a set-up fiber layer constitutes a set-up fiber layer] of 100-1000 micrometers.

[Claim 5] The fiber structure object for paint implements according to claim 4 whose height of a set-up fiber layer including a porosity skin is 2-18mm.

[Claim 6] The fiber structure object for paint implements given in any 1 term of claims 1-5 which are the crimped staples which the thermal melting arrival nature crimped staple which constitutes a set-up fiber layer consists of a low-melt point point polymer and a fiber formation nature polymer, and consist of the compound spinning fiber and/or blend spinning fiber to which a low-melt point point polymer exists in a part of fiber front face [at least].

[Claim 7] the paint roller which it comes to attach in a base material by using the fiber structure object for paint implements given in any

1 term of claims 1-6 as a painted surface, or a trowel -- the brush.
[Claim 8] the paint roller according to claim 7 which is an object for paint of a photocatalyst coating, or a trowel -- the brush.
[Claim 9] Field of one of the two in the condition upwards towards of not having the set-up fiber layer already to the fiber structure object which has the set-up fiber layer which consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass % on one side of ground weave The manufacture approach of the fiber structure object for paint implements according to claim 1 characterized by heat-treating at the temperature more than [the melting point -50 of said thermal melting arrival nature crimped staple (degree C)], carrying out partial welding of the thermal melting arrival nature crimped staple by the inside of a set-up fiber layer, and forming a reticulated welding layer after spraying water from field of this **** one of the two.
[Claim 10] The fiber structure object which has the set-up fiber layer which consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass % on one side of ground weave The manufacture approach of the fiber structure object for paint implements according to claim 4 which carries out thermocompression bonding processing from the front-face side of a set-up fiber layer at the temperature more than the melting point of a thermal melting arrival nature crimped staple, is made to carry out welding of the thermal melting arrival nature crimped staple of a surface part, and is characterized by forming a porosity skin with a thickness of 100-1000 micrometers in the front face of a set-up fiber layer.
[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the fiber structure object and its manufacture approach for paint implements. This invention relates to the fiber structure object which uses the low coating especially water, and/or alcohol of viscosity for production of a paint implement which is suitable at the coating of a photocatalyst coating with the low viscosity used as a solvent, and its manufacture approach more at a detail.
[0002]

[Description of the Prior Art] as a paint implement -- the brush, a paint roller, and a trowel -- there is a brush etc. and these are selected by the class of painted surface-ed, the skillful degree of a configuration and a coating person, etc. Especially, a paint roller is one of the paint implements used best among coating contractors. The general-purpose paint roller is conventionally formed by twisting piloerection woven knitted goods, a nonwoven fabric, etc. which implanted the pile yarn made from a fur and a synthetic fiber around the core material of the product made from plastics which rotates around a shaft, or the product made of paper. The class of fiber which constitutes a nonwoven fabric needs of the paint roller of these former the class of synthetic fiber which constitutes selection of the class of fur, and the piloerection of piloerection woven knitted goods according to the class of the paint purpose and coating etc., selection of piloerection length, to be selected, etc., and there is nothing that is called an allround paint roller. moreover, the engine performance of a paint roller expresses the absorptivity ability of a coating -- " -- it contains and ", the "discharge" showing the outflow engine performance of a coating, and the performance of paint are expressed -- " -- although it was finished and was estimated by "in many cases, the above-mentioned conventional paint roller was difficult to fully satisfy these engine performance.

[0003] Then, the paint roller of various gestalten is proposed for the purpose of the improvement in the absorptivity ability ("implication") of the above-mentioned coating, the outflow engine performance ("discharge") of a coating, "a result" of a painted surface, etc. for example, the repeat of the compression received in JP,2-4679,U by paint -- a pile -- falling -- the impregnating ability (the absorptivity ability of a coating --) of a coating In order for "an implication" to be made not to be spoiled for a short period of time and to prevent the omission of the pile from ground weave The high pile knitting fabric which uses the low-melt point point bicomponent fiber which consists of a low-melt point point component and a high-melting component at 10% or more of a rate of pile configuration fiber is built, and the roller-like brush which twisted around the roller heart the high pile knitting fabric on which the pile configuration fiber was pasted up partially is indicated. Moreover, the cylinder roll made from elasticity foamed plastics is attached in the periphery of a bell shape core material,

and while carrying out electrostatic frocking of the detailed single fiber to the front face of this cylinder roll, the paint roller which prepared slitting in the front face of a cylinder roll is indicated by JP,2-100674,U in order to improve a result of paint. Furthermore, the reticulated coating reservoir organization which consists of a polyurethane disconnection float etc. is prepared on a coating impermeable base for the purpose of increase of the amount of adsorption of a coating, carrying out smoothly of the outflow of a coating, and easy-izing of washing of a coating, and the coating applicator which combined the outer layer which consists of still more flexible network structure on it in the mesh part is indicated by JP,4-98468,U.

[0004] however, with the roller-like brush indicate by above-mentioned JP,2-4679,U, pile configuration fiber continue in the whole thickness direction of the pile section, and partial adhesion be only carry out at random -- **** -- since it do not pass and the pile section do not fully have in the function as a coating reservoir, the absorptivity ability (" -- contain -- ") of a coating be inferior, it be easy to be generate, a liquid lappet use, and there be a problem be hot. And it is hard to apply a coating to homogeneity thinly. Moreover, the coating applicator indicated by the paint roller indicated by above-mentioned JP,2-100674,U and JP,4-98468,U is not enough satisfactory in respect of the absorptivity ability ("implication") of a coating, the outflow engine performance ("discharge") of a coating, "a result" of a painted surface, etc., either. That is, in order to prevent the lappet (liquid lappet) of the coating which made the coating adhere to a paint implement in painting using paint implements, such as a paint roller, painting, after pressing a paint implement lightly for example, on a network and performing housekeeping operation except an excessive coating is performed widely. However, it is difficult for the maintenance ability of a coating not to be enough, therefore for most coatings to be easy to be lost from a paint roller with the conventional paint roller indicated by the above-mentioned official report etc., at the time of the above mentioned housekeeping operation, and to perform a paint operation smoothly.

[0005] Furthermore, the photocatalyst coating containing the so-called photocatalysts, such as anatase mold titanium oxide, attracts attention according to the outstanding disintegration of an atmospheric pollutant,

an antibacterial action, a deodorization operation, an antifouling operation, etc., and many proposals about a photocatalyst coating or its method of application are made in recent years (for example, JP,11-246787,A, JP,2000-129174,A, JP,2000-189888,A, JP,2000-273355,A, etc.). The construction to the extensive application of various kinds of building outer walls, the wall of a building, the external surface of a windowpane and an inside, a bridge, a highway sound-proof wall, a rail car, the car body of an automobile, the external surface of a windowpane, an inside, and others is tried by many outstanding properties which described the photocatalyst coating above. Generally the photocatalyst coating is using water and/or alcohol as the medium (solvent), and the viscosity is very low (there is also a thing of about 1 mPa-s in the thing through water). therefore, a paint roller and a trowel -- in paint implements, such as a brush, if the absorptivity ability (" -- containing -- ") of a coating is low, a liquid lappet is produced and used at the time of spreading of a photocatalyst coating, there is a problem of being hot, and, moreover, the good paint film of a result cannot be formed. To paint thinly is demanded in order for especially a photocatalyst coating to fully demonstrate the function of a photocatalyst. However, as mentioned above, the absorptivity ability ("implication") of a coating was low, it was easy to produce the problem of a liquid lappet by it, discharge of a coating was not performed smoothly, but, moreover, control of the thickness of a paint film was it is difficult to hold enough coatings and very difficult for paint implements, such as the above-mentioned conventional paint roller.

[0006] When based on spray painting, painting thinly using a hypoviscosity coating is possible, but since the yield is very bad, it is not suitable for paint of an expensive photocatalyst coating with scattering of a coating etc. the paint roller which can be thinly applied by uniform thickness by the good yield from this point, without producing a coating with the low viscosity of a photocatalyst coating etc. for the thickness variation of a liquid lappet and a paint film etc., and a trowel -- development of the material used for a paint implement and such paint implements, such as a brush, was called for.

[0007]

[Problem(s) to be Solved by the Invention] Thickness is uniform, without the purpose of this invention being excellent in the absorptivity ability

("implication") of a coating, the outflow engine performance ("discharge") of a coating, and the result engine performance of a painted surface, and producing the ununiformity of a liquid lappet and paint film thickness etc. the paint roller which comes to use this material for the manufacture approach of the material for paint implements which can form the good paint film of a result, and this material, and a list, and a trowel -- it is offering paint implements, such as a brush. the paint roller which comes to use this material for the material for paint implements which especially this invention has uniform thickness, without producing a liquid lappet, the ununiformity of paint film thickness, etc. also when using a coating with the low viscosity of a photocatalyst coating etc., and can form a thin paint film with a good result smoothly, its manufacture approach, and a list, and a trowel -- it is offering paint implements, such as a brush.

[0008]

[Means for Solving the Problem] this invention persons came examination in piles wholeheartedly that the above-mentioned purpose should be attained. Consequently, the set-up fiber layer (pile layer) which consists of fiber which contains the thermal melting arrival nature crimped staple which has the rate of crimp expanding of the predetermined range in one side of ground weave, such as ******, at a specific rate was formed, in the front-face side of this set-up fiber layer, the reticulated welding layer to which it considered as the bulky bulky layer, without carrying out welding of the crimped staples, and partial welding of the crimped staples was carried out inside this bulky layer was made to form, and the specific fiber structure object was manufactured. And the thing said reticulated welding layer of this fiber structure object is [thing] excellent in the possession ability of a coating when many things are investigated about the property of the fiber structure object acquired by that cause, And the thing for which it has good resiliency in a reticulated welding layer by the partial welding of a thermal melting arrival nature crimped staple, therefore, the fiber structure object -- using -- a paint roller and a trowel, if paint implements, such as a brush, are produced Without having obtained the paint implement which is excellent in the absorptivity ability ("implication") of a coating, the outflow engine performance ("discharge") of a coating, and the result engine performance of a painted surface, and producing the ununiformity

of a liquid lappet and paint film thickness etc., thickness was uniform and it found out that the good paint film of a result could be formed. a paint roller and a trowel for the coating of hypoviscosity, such as a photocatalyst coating, to paint especially a fiber structure object such that formed said reticulated welding layer carried out inside the set-up fiber layer, and formed the bulky bulky layer in the outside -- it found out that it was suitable as a material for coating sides in paint implements, such as a brush. And although such a fiber structure object is suitable as a material for paint implements as long as it has the specific structure described above regardless of the process, this invention persons Especially The set-up fiber layer (pile layer) which consists of a crimped staple which contains a thermal melting arrival nature crimped staple in one side of ground weave, such as ******, at a specific rate, and has the rate of crimp expanding of the predetermined range is formed. After [which does not have the set-up fiber layer of the becoming fiber structure object] having already sprayed water from field of one of the two, it found out being manufactured smoothly by heating at predetermined temperature.

[0009] Furthermore, this invention persons set on the above mentioned fiber structure object in which the set-up fiber layer (pile layer) which consists of fiber which contains the thermal melting arrival nature crimped staple which has the rate of crimp expanding of the predetermined range in one side of ground weave, such as ******, at a specific rate was formed. Crimped staples are replaced with the above-mentioned method which carries out partial welding in the inside part of a set-up fiber layer. Also when the method in which the porosity skin which has the hole which is made to carry out welding of this crimped staple to the surface part of a set-up fiber layer, and a coating may pass is made to form was adopted, it found out that the material for paint implements which is excellent in the paint engine performance and the result engine performance of a painted surface was obtained. That is, with this fiber structure object in which the porosity skin by the welding of a thermal melting arrival nature crimped staple was formed on the front face of a set-up fiber layer, when a coating is made to adhere to this fiber structure object, a coating particle is held at homogeneity at the hole section of a large number which exist in a porosity skin. On the other hand, solvents, such as water, are held through a porosity skin at an

inside crimped staple layer. And when this fiber structure object was pressed at the time of paint, it found out that the solvent currently held at the inside crimped staple layer flowed backwards on a front face, conveyed the coating particle currently held at the hole section of a surface porosity skin to a painted surface-ed, and formed a uniform paint film in a painted surface-ed. and the paint roller and trowel for painting the hypoviscosity coating with which this fiber structure object that has this porosity skin of a set-up fiber layer also contains detailed coating particles, such as a photocatalyst coating, -- it found out that it was suitable especially as a material for paint implements, such as a brush. this invention persons and such a fiber structure object By carrying out thermocompression bonding processing of the fiber structure object which comes to form the set-up fiber layer (pile layer) which consists of a crimped staple which contains a thermal melting arrival nature crimped staple in one side of ground weave, such as ******, at a specific rate, and has the rate of crimp expanding of the predetermined range from the front-face side at the temperature more than the melting point of a thermal melting arrival nature crimped staple Based on headers and those knowledge, this invention was completed for the ability to manufacture smoothly.

[0010] Namely, this invention (1) It has a set-up fiber layer on one side of ground weave. This set-up fiber layer consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass %. This set-up fiber layer The inside part is the fiber structure object for paint implements (this may be called below "fiber structure object A for paint implements") characterized by making the nothing bulky layer with the bulky lateral part of the upper part of this reticulated welding layer for the reticulated welding layer formed of the partial welding of said thermal melting arrival nature crimped staple.

[0011] And this invention (2) The height of a set-up fiber layer is 3-20mm. The fiber structure object A for paint implements of the above (1) whose ratios of [thickness of reticulated welding layer] : [thickness of a bulky layer] are 9:1-1:9; It reaches. (3) The water retention ability of a reticulated welding layer includes the above (1) or fiber structure object A; for paint implements of (2) which is 4 to 16 times the fiber mass which forms the reticulated welding layer as a desirable mode.

[0012] Furthermore, this invention (4) Have a set-up fiber layer on one side of ground weave, and this set-up fiber layer consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass %. The surface part of a set-up fiber layer is the fiber structure object for paint implements (this may be called below "fiber structure object B for paint implements") characterized by making the porosity skin with a thickness [by the welding of said thermal melting arrival nature crimped staple which constitutes a set-up fiber layer] of 100-1000 micrometers.

[0013] And this invention (5) The fiber structure object B for paint implements of the above (4) whose height of a set-up fiber layer including a porosity skin is 2-18mm; It reaches. (6) The thermal melting arrival nature crimped staple which constitutes a set-up fiber layer consists of a low-melt point point polymer and a fiber formation nature polymer. One fiber structure object A for paint implements of aforementioned (1) - (3), the above (4), or fiber structure object B; for paint implements of (5) which is the crimped staple which consists of the compound spinning fiber and/or blend spinning fiber to which a low-melt point point polymer exists in a part of fiber front face [at least] is included as a desirable mode.

[0014] furthermore, this invention -- (7) the paint roller which it comes to attach in a base material by using one fiber structure object A for paint implements of aforementioned (1) - (6), or the fiber structure object B for paint implements as a painted surface, or a trowel -- the brush -- it is --; (8) the paint roller of the above (7) which is an object for paint of a photocatalyst coating, or a trowel -- the brush is included as a desirable mode.

[0015] And this invention (9) As opposed to the fiber structure object which has the set-up fiber layer which consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass % on one side of ground weave After spraying water from field of this **** one of the two in the condition which has already turned field of one of the two upwards of not having the set-up fiber layer, The manufacture approach of the fiber structure object A for paint implements the above (1) characterized by carrying out dry heat treatment at the temperature more than [the melting point -50 of said thermal melting arrival nature crimped staple

(degree C)], carrying out partial welding of the thermal melting arrival nature crimped staple by the inside of a set-up fiber layer, and forming a reticulated welding layer; It reaches. (10) The fiber structure object which has the set-up fiber layer which consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass % on one side of ground weave Carry out thermocompression bonding processing from the front-face side of a set-up fiber layer at the temperature more than the melting point of a thermal melting arrival nature crimped staple, and welding of the thermal melting arrival nature crimped staple of a surface part is carried out. It is manufacture approach [of the fiber structure object B for paint implements of the above (4) characterized by forming a porosity skin with a thickness of 100-1000 micrometers in the front face of a set-up fiber layer];.

[0016]

[Embodiment of the Invention] This invention is explained below at a detail. The fiber structure object A for paint implements of this invention and the fiber structure object B for paint implements all use as the base the fiber structure object which has a set-up fiber layer on one side of ground weave. A set-up fiber layer is a layer which consists of many piles, and the pile which constitutes a set-up fiber layer needs to be formed from the fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass %. It is desirable that 80 - 100% of the fiber (pile) which constitutes a set-up fiber layer from a fiber structure object A for paint implements of this invention and a fiber structure object B for paint implements consists of a thermal melting arrival nature crimped staple of 5 - 30% of rates of crimp expanding, and it is more desirable that 100% (whole quantity of a pile) consists of thermal melting arrival nature crimped staples of 5 - 30% of rates of crimp expanding.

[0017] The content of the thermal melting arrival nature crimped staple in the fiber (pile) which constitutes a set-up fiber layer becomes inadequate [the welding between the crimped staples which constitute a set-up fiber layer as it is under 30 mass %]. consequently, with the fiber structure object A for paint implements, formation of the reticulated welding layer by the partial welding between fiber (namely,

partial welding of thermal melting arrival nature crimped staples and partial welding of a thermal melting arrival nature crimped staple and other fiber) becomes difficult, the absorptivity ability (" -- containing -- ") of a coating falls to the inside part of a set-up fiber layer, and, moreover, the resiliency of a reticulated welding layer falls to it. Moreover, with the fiber structure object B for paint implements, formation of the porosity skin in the surface part of a set-up fiber layer becomes inadequate, a surface smooth condition is spoiled and a result of a painted surface worsens.

[0018] As a thermal melting arrival nature crimped staple which constitutes a part of fiber [at least] (pile) which constitutes a set-up fiber layer, it consists of a low-melt point point polymer and a fiber formation nature polymer, and the crimped staple which consists of the compound spinning fiber and/or blend spinning fiber to which a low-melt point point polymer exists in a part of fiber front face [at least] is used preferably. In that case, as for this thermal melting arrival nature crimped staple, it is more desirable that it is that which welds to self welding or other fiber at 110-190 degrees C in the state of dry heat, or softens with hot water 95 degrees C or more under a wet heat atony, and is welded to self welding or other fiber.

[0019] As compound formation in case a thermal melting arrival nature crimped staple is above mentioned compound spinning fiber or blend spinning fiber, or a mixed gestalt For example, the sheath-core mold which uses a fiber formation nature polymer as a heart component, and uses a low-melt point point polymer as a sheath component, The sea-island type which uses a fiber formation nature polymer as an island component, and uses a low-melt point point polymer as a sea component, the side-by-side mold with which a fiber formation nature polymer and a low-melt point point polymer make lamination structure can be mentioned, among those it is desirable that they are a sheath-core mold or a sea-island type but.

[0020] as the low-melt point point polymer which constitutes said compound spinning fiber and blend spinning fiber which are preferably used as a thermal melting arrival nature crimped staple, and which were carried out -- olefin system polymers, such as for example, an ethylene-vinyl alcohol system copolymer, polyethylene, and polypropylene, a polyamide system polymer, etc. -- it can mention --

among those -- also coming out -- an ethylene-vinyl alcohol system copolymer has a desirable hydrophilic property from a high point. Moreover, as a fiber formation nature polymer which constitutes this compound spinning fiber and blend spinning fiber, for example, polyester, a polyamide, polypropylene, etc. can be mentioned, among those crimp grant nature is [but] desirable [polyester] from a good point.

[0021] Moreover, the thermal melting arrival nature crimped staple which constitutes a set-up fiber layer requires as mentioned above that the rate of crimp expanding should be 5 - 30%. In a set-up fiber layer, contact between fiber (pile) becomes it inadequate that it is less than 5% of rates of crimp expanding of a thermal melting arrival nature crimped staple. Consequently, with the fiber structure object A for paint implements, the reticulated welding layer by the partial welding of fiber is no longer formed inside a set-up fiber layer, and the absorptivity ability ("implication") of a coating and the resiliency of a reticulated welding layer decline. Moreover, with the fiber structure object B for paint implements, formation of the porosity skin in the front face of a set-up fiber layer becomes inadequate, a surface smooth condition is spoiled, a result of a painted surface worsens, moreover the bulkiness of the bulky layer under a porosity skin becomes low, the absorptivity ability ("implication") of a coating falls, coating nature becomes a defect, and control of the thickness of the paint film at the time of paint becomes difficult further. On the other hand, if the rate of crimp expanding of the thermal melting arrival nature crimped staple which constitutes a set-up fiber layer exceeds 30%, in any [of the fiber structure object A for paint implements, and the fiber structure object B for paint implements] case, the outflow engine performance ("discharge") of a coating will fall, paintwork will become a defect, and, moreover, control of the thickness of a paint film will become difficult. as for the fiber (pile) which constitutes a set-up fiber layer, it is desirable that the rate of crimp expanding is formed using the thermal melting arrival nature crimped staple which is 10 - 20% from the point that control of the absorptivity ability (" -- containing -- ") of a coating, the outflow engine performance ("discharge"), and a paint film becomes fitness more. In addition, "the rate of crimp expanding" in this specification means the rate of crimp expanding measured by the approach indicated in the term of the following examples.

[0022] Although the fiber (pile) which constitutes a set-up fiber layer may contain other different fiber from the above-mentioned thermal melting arrival nature crimped staple at a rate of 0 - 70 mass % in the fiber structure object A for paint implements of this invention, and the fiber structure object B for paint implements Especially the class of other fiber is not restricted. For example, polyester, a polyamide, The synthetic fiber of the crimp of the non-thermal melting arrival nature which consists of one sort, such as polypropylene, an acrylic polymer, polyvinyl alcohol, and a polyvinylidene chloride, or two sorts or more, or non-crimp, Semi-synthetic fibers, such as a viscose and rayon, cotton, wool, silk, etc. can be mentioned, and those one sort or two sorts or more can be used. When forming using other fiber with the thermal melting arrival nature crimped staple which described the set-up fiber layer above, polyester fiber is preferably used among the above-mentioned fiber from an adhesive point with a crimp property, thermal melting arrival nature, and fiber. When using together a thermal melting arrival nature crimped staple and other fiber and forming a set-up fiber layer, it is desirable that both are fully made to do mixed distribution.

[0023] As for the single fiber fineness of the thermal melting arrival nature crimped staple which constitutes a set-up fiber layer (pile section), and other fiber, it is desirable that it is 1 - 15dtex from the point of the ease of containing of a coating, and it is more desirable that it is 3 - 7dtex. Moreover, as for the pile consistency in a set-up fiber layer, it is desirable that it is 7000-50000 (single fiber) per two 1cm of fiber structure objects from points, such as a result of handstand prevention of a pile, the absorptivity ability ("implication") of a coating, the outflow engine performance ("discharge"), and paint, and it is more desirable that it is 10000-30000. Furthermore, even if it forms a set-up fiber layer from the pile with the same height (fiber), it may be formed from two or more piles (fiber) with which height differs, or any are sufficient as it. However, in any case, it is necessary to change the outermost surface section of a set-up fiber layer into the condition that height gathered. Moreover, as for the fiber (pile) which constitutes a set-up fiber layer, it is desirable to have the shape of a cut pile from points, such as a result of coating nature and a paint film.

[0024] Moreover, the ground weave in the fiber structure object A for paint implements of this invention and the fiber structure object B for paint implements functions as a base for attaching in a paint implement base the attaching part of the pile which constitutes a set-up fiber layer, the fiber structure object A for paint implements of this invention, and the fiber structure object B for paint implements. Especially the classes of ground weave in the fiber structure object A for paint implements and the fiber structure object B for paint implements may be any of the nonwoven fabrics which were not restricted but were interlaced by texture, knitting fabric, needle punching, fluid processing, etc., and those two combined things or more. Moreover, especially the class of the fiber which forms ground weave, or yarn may not be restricted, either, but a synthetic fiber which was described above, the semi-synthetic fiber, and the natural fiber may be formed either. Furthermore, especially the eyes of ground weave are not restricted, either but it can adjust suitably. Although the rate of crimp expanding needs to consist of fiber (pile) which contains the thermal melting arrival nature crimped staple which is 3 - 10% at a rate of 30 - 100 mass % as the set-up fiber layer in the fiber structure object A for paint implements of this invention and the fiber structure object B for paint implements was described above, **** of ground weave which is not included even if the thermal melting arrival nature crimped staple is included is also good. When ground weave contains the thermal melting arrival nature crimped staple, welding immobilization of the fiber (pile) from which this thermal melting arrival nature crimped staple constitutes a set-up fiber layer is carried out at ground weave, and the omission prevention function of a pile is achieved.

[0025] Especially the manufacture approach of a fiber structure object of making the base of the fiber structure object A for paint implements of this invention and the fiber structure object B for paint implements is not restricted. Yarn or fiber for ground weave, The thermal melting arrival nature crimped staple whose rate of crimp expanding is 3 - 10% can be manufactured according to the manufacture approach of the pile textile of the conventional known using the fiber (yarn) for set-up fiber layers (pile) included at a rate of 30 - 100 mass %.

[0026] and with the fiber structure object A for paint implements of this invention In the fiber structure object which has the set-up fiber

layer which consists of fiber (pile) which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 3 - 10% at a rate of 30 - 100 mass % on one side of ground weave The reticulated welding layer formed inside the set-up fiber layer of the partial welding (namely, partial welding of thermal melting arrival nature crimped staples and/or partial welding of a thermal melting arrival nature crimped staple and other fiber) of a thermal melting arrival nature crimped staple exists. A bulky bulky layer exists in the front-face side of the set-up fiber layer of the outside of this reticulated welding layer.

[0027] Below, with reference to drawing 1 and drawing 2 , the fiber structure object A for paint implements of this invention is explained. Drawing 1 and drawing 2 are drawings (sectional view of the thickness direction) having shown typically the example of the fiber structure object A for paint implements of this invention. It cannot be overemphasized that the fiber structure object A for paint implements of this invention is not restricted to the thing of drawing 1 and drawing 2 at all. The thermal melting arrival nature crimped staple with which 1 constitutes ground weave and 2 constitutes a pile in drawing 1 and drawing 2 , Other fiber from which 3 constitutes a pile, the set-up fiber layer by which 4 is constituted from a pile, the reticulated welding layer to which 4a exists inside the set-up fiber layer 4, the bulky bulky layer to which 4b exists in the surface section of the set-up fiber layer 4 on the outside of reticulated welding layer 4a, and 5 and 6 show the welding section of the thermal melting arrival nature crimped staple 2. Although the fiber structure object A for paint implements with which the fiber (pile) which constitutes the set-up fiber layer 4 is drawing 1 only from the thermal melting arrival nature crimped staple 2 was shown, of course, a thermal melting arrival nature crimped staple and other fiber are used together, and the set-up fiber layer 4 may be formed, as long as it is more than 30 mass % that the rate of a thermal melting arrival nature crimped staple described above. Moreover, although the height of the fiber (pile) which constitutes the set-up fiber layer 4 is equal to the whole with the fiber structure object A for paint implements of drawing 1 R> 1, the set-up fiber layer 4 may be formed from the fiber (pile) from which height differs so that it may illustrate on the fiber structure object A for paint implements of drawing 2 . However,

in order to maintain good paintwork in that case, the thing to which the pile height in the outermost surface of the set-up fiber layer 4 becomes the same (the front face of a set-up fiber layer becomes flat) and which is made like is required. The fiber structure object A for paint implements of drawing 2 is the example which formed the set-up fiber layer 4, using the thermal melting arrival nature crimped staple 2 with low height, and other fiber 3 higher than it as a pile. In addition, it does not matter even if the welding section the thermal melting arrival nature crimped staple carried out [the section] partial weld depending on the case exists also in bulky layer 4b if it is some as shown in drawing 1 R> 1.

[0028] With the fiber structure object A for paint implements of drawing 1 , in reticulated welding layer 4a in the set-up fiber layer 4, both thermal melting arrival nature crimped staple 2 contacts partially by crimp, much welding sections 5 and a tangle of fiber are formed, and the fiber gap is micrified by it from the fiber gap in bulky layer 4b by reticulated welding layer 4a. Moreover, with the fiber structure object A for paint implements of drawing 2 , it sets to reticulated welding layer 4a in the set-up fiber layer 4. Both thermal melting arrival nature crimped staple 2 contacts partially, much welding sections 5 and a tangle are formed, the thermal melting arrival nature crimped staple 2 and other fiber 3 contact partially by the crimp of a thermal melting arrival nature crimped staple further, and much welding sections 6 and a tangle are formed among both fiber. And in reticulated welding layer 4a, the fiber gap is micrified by it from the fiber gap in bulky layer 4b. Consequently, with drawing 1 and the fiber structure object A for paint implements of drawing 2 R> 2, capillarity arises into a reticulated welding layer 4a part, the coating absorbed from the front face of the fiber structure object A for paint implements is promptly absorbed by reticulated welding layer 4a through bulky layer 4b, and, moreover, a coating is held by the micrified fiber gap good at reticulated welding layer 4a. And if thrust joins the fiber structure object A for paint implements at the time of coating, the coating currently held at reticulated welding layer 4a will be transmitted to the fiber (a thermal melting arrival nature crimped staple and/or other fiber) which constitutes bulky layer 4b, will flow on a front face again, and will be applied to a painted surface-ed. Furthermore, since resiliency is given to reticulated

welding layer 4a by the partial welding of the thermal melting arrival nature crimped staple 2, adjustment of the press to the fiber structure object A for paint implements becomes easy, and the discharge quantity of the coating currently held at reticulated welding layer 4a can be controlled good. Moreover, since bulky layer 4b which exists in the front-face side of the set-up fiber layer 4 does not have the partial welding of a thermal melting arrival nature crimped staple, or it is in the bulky condition by fiber with little partial welding (a thermal melting arrival nature crimped staple and/or other fiber) and the fiber (pile) height is moreover arranged with homogeneity, the coating which has flowed out of reticulated welding layer 4a is applied to a painted surface-ed at homogeneity. Therefore, thickness is uniform, without this fiber structure object A for paint implements being excellent in the absorptivity ability ("implication") of a coating, the outflow engine performance ("discharge") of a coating, and the result engine performance of a painted surface, and producing the ununiformity of a liquid lappet and paint film thickness etc. a paint roller and a trowel to be able to form the good paint film of a result and for the coating of especially hypoviscosity, such as a photocatalyst coating, paint -- it is suitable as a material for coating sides in paint implements, such as a brush.

[0029] Although it can adjust according to the class of paint implement which attaches the class of thermal melting arrival nature crimped staple which constitutes a set-up fiber layer, single fiber fineness, physical properties, and the fiber structure object A for paint implements etc. Four to 16 times of fiber mass in which the water retention ability of reticulated welding layer 4a forms reticulated welding layer 4a with the fiber structure object A for paint implements of this invention, Especially, it is desirable from points, such as a result of the absorptivity ability ("implication") of a coating, the outflow engine performance ("discharge"), and a paint film, that they are six to 10 times, and it can obtain such water retention ability by adjusting extent of the partial welding in reticulated welding layer 4a. In addition, the water retention ability of the reticulated welding layer in this specification means the water retention capacity measured by the approach indicated in the term of the following examples.

[0030] Moreover, it is desirable from points, such as a result of the

absorptivity ability ("implication") of a coating, the outflow engine performance ("discharge"), and a paint film, that the height of the set-up fiber layer 4 is generally 3-20mm, and the ratios of [thickness of reticulated welding layer] : [thickness of bulky layer] : are 9:1-1:9 with the fiber structure object A for paint implements of this invention.

[0031] Although the fiber structure object A for paint implements of this invention may be manufactured by which approach as long as it has the above-mentioned structure, it can manufacture smoothly by the following approaches, for example. A knitting-and-weaving machine, a nonwoven fabric manufacturing installation, etc. are used. The single round-braid ground, double rales knitting fabric, In case textiles, such as a multiple fabric and a laminating nonwoven fabric, are manufactured, the fiber (yarn) which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 3 - 10% at a rate of 30 - 100 mass % is supplied as cut pile yarn. The fiber structure object which has the set-up fiber layer to which the rate of crimp expanding consists of fiber (cut pile) which contains the thermal melting arrival nature crimped staple which is 3 - 10% at a rate of 30 - 100 mass % on one side of ground weave is manufactured. Subsequently, after [which does not have a set-up fiber layer] opening the cut pile yarn of a fiber structure object using a hair crack machine, already turning field (rear face) of one of the two to the bottom and spraying water from this rear face at a rate of 70 - 150 mass % to the mass of a fiber structure object, dry heat treatment of the hot blast processing etc. is carried out at the temperature more than [the melting point -50 of a thermal melting arrival nature crimped staple (degree C)]. The fiber structure object A for paint implements of this invention to which a reticulated welding layer exists inside a set-up fiber layer, and a bulky bulky layer exists in the front-face side of the set-up fiber layer of the outside of a reticulated welding layer by it is acquired.

[0032] By turning a rear face without a set-up fiber layer (cut pile) upwards by the above-mentioned approach, turning a field with a set-up fiber layer (cut pile) down, and spraying water from this rear face Near the tip of a cut pile will be in the condition of having been rich in moisture, by shifting to near the tip of the cut pile with which the sprayed water constitutes a set-up fiber layer through ground weave from a rear face (flowing down), and near a root and the interstitial segment

of a cut pile will be in a condition with little moisture. And by carrying out dry heat treatment in the condition, heating is controlled by the latent heat of vaporization of moisture, softening and melting of a thermal melting arrival nature crimped staple are prevented, and the amount of [of the cut pile containing many moisture] point becomes [the amount of / of a cut pile / (front-face side of a set-up fiber layer) point] a bulky bulky layer by it. On the other hand, according to there being little moisture, a thermal melting arrival nature crimped staple softens or fuses the root and interstitial segment of a cut pile at the time of heating, the partial welding between fiber produces them, and a reticulated welding layer is formed inside a set-up fiber layer.

[0033] Moreover, it sets on the fiber structure object which has the set-up fiber layer which consists of fiber (pile) which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 3 - 10% at a rate of 30 - 100 mass % on one side of ground weave in the fiber structure object B for paint implements of this invention. The porosity skin with a thickness [by the welding of said thermal melting arrival nature crimped staple which constitutes a set-up fiber layer] of 100-1000 micrometers exists in the front face of a set-up fiber layer.

[0034] Below, with reference to drawing 3 , the fiber structure object B for paint implements of this invention is explained. Drawing 3 is drawing (sectional view of the thickness direction) having shown typically the example of the fiber structure object B for paint implements of this invention. The fiber structure object B for paint implements of this invention is not restricted to the thing of drawing 3 at all. In drawing 3 , the hole section [in / the thermal melting arrival nature crimped staple with which 1 constitutes ground weave and 2 constitutes a pile, the set-up fiber layer by which 4 is constituted from a pile, the porosity skin formed of the welding in the surface part of the thermal melting arrival nature crimped staple 2 with which 4c constitutes the set-up fiber layer 4, and 4d, and / in 7 / porosity skin 4c] is shown. [a non-welding fiber layer] Although the fiber structure object B for paint implements with which the fiber (pile) which constitutes the set-up fiber layer 4 is drawing 3 R> 3 only from the thermal melting arrival nature crimped staple 2 was shown, of course, a thermal melting arrival nature crimped staple and other fiber are used

together, and the set-up fiber layer 4 may be formed, as long as it is more than 30 mass % that the rate of a thermal melting arrival nature crimped staple described above.

[0035] With the fiber structure object B for paint implements of drawing 3 , if a coating is given to the front face of the fiber structure object B for paint implements, a coating particle will be held at the hole section 7 of a large number which exist in porosity skin 4c. At it and coincidence, media, such as water, pass along the hole section 7, reach promptly 4d of non-welding fiber layers located inside porosity skin 4c, and are held at 4d of these non-welding fiber layers. And if thrust joins the fiber structure object B for paint implements at the time of coating, the medium currently held at 4d of non-welding fiber layers will flow backwards to the porosity skin 4c side, will carry the coating particle currently held at the hole section 7, and will form a uniform paint film in a painted surface-ed. Since the front face of the fiber structure object B for paint implements is in the flat condition by porosity skin 4c, a uniform paint film can be formed in a painted surface-ed also with this point. The fiber structure object B for paint implements therefore, like the fiber structure object A for paint implements Thickness is uniform, without excelling in the absorptivity ability ("implication") of a coating, the outflow engine performance ("discharge") of a coating, and the result engine performance of a painted surface, and producing the ununiformity of a liquid lappet and paint film thickness etc. a paint roller and a trowel to be able to form the good paint film of a result and for the coating of especially hypoviscosity, such as a photocatalyst coating, paint -- it is effective as a material for coating sides in paint implements, such as a brush.

[0036] With the fiber structure object B for paint implements, it is required for the thickness of the porosity skin of the front face to be 100-1000 micrometers as mentioned above, and it is desirable that it is 250-600 micrometers. Surface surface smoothness is lost as the thickness of a porosity skin is less than 100 micrometers, and it is hard coming to form a paint film with uniform thickness. On the other hand, if the thickness of a porosity skin exceeds 1000 micrometers, in order that the thickness of the non-welding fiber layer inside a porosity skin may decrease relatively, the absorptivity ability of a coating falls and the ununiformity of a liquid lappet and a paint film etc. is produced.

Moreover, as for the porosity skin of the fiber structure object B for paint implements, it is desirable from the point of the absorptivity ability of a coating, and the outflow engine performance to have about 2000-5000 detailed hole sections per two of about about 5-90 micrometers of apertures wide opened on the front face 1cm. Furthermore, it is desirable that the height of the set-up fiber layer which includes a porosity skin with the fiber structure object B for paint implements from points, such as a result of the absorptivity ability of a coating, the outflow engine performance, and a painted surface, is [thickness] 2-18mm, and it is more desirable that it is 5-10mm.

[0037] As long as it has the above-mentioned structure, the fiber structure object B for paint implements of this invention Although you may manufacture by which approach, the fiber structure object which has the set-up fiber layer which consists of fiber which contains the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass % on one side of ground weave Thermocompression bonding processing can be carried out from the front-face side of a set-up fiber layer at the temperature more than the melting point of a thermal melting arrival nature crimped staple, welding of the thermal melting arrival nature crimped staple of a surface part can be carried out, and it can manufacture smoothly by the approach of making a porosity skin with a thickness of 100-1000 micrometers forming in the front face of a set-up fiber layer.

[0038] the fiber structure object A for paint implements of this invention, or the fiber structure object B for paint implements -- a paint roller and a trowel -- it can be effectively used as a material for paint implements, such as a brush and a paint brush. In the case of a paint roller, cut the fiber structure object A for paint implements of this invention, or the fiber structure object B for paint implements in the shape of a strip of paper, and it applies adhesives to a rear face. How to twist spirally and fix to the surroundings of the core material for rollers, The fiber structure object A for paint implements of this invention or the fiber structure object B for paint implements can be cut in a rectangle, adhesives can be applied to a rear face, and the approach of rolling it, as surrounds the core material for rollers longwise, and fixing etc. can be adopted and manufactured. moreover, the thing for which the fiber structure object A for paint implements

of this invention or the fiber structure object B for paint implements is stuck on a flat front face tabular object (rectangular parallelepiped-like object) -- the trowel for paint -- the brush can be manufactured. Furthermore, a brush-like paint implement may be manufactured using the fiber structure object A for paint implements of this invention, or the fiber structure object B for paint implements.

[0039] the paint roller manufactured using the fiber structure object A for paint implements, or the fiber structure object B for paint implements, and a trowel -- paint implements, such as a brush It excels in the absorptivity ability ("implication") of a coating, the outflow engine performance ("discharge") of a coating, and the result engine performance of a painted surface. It can use for paint of various coatings taking advantage of such an outstanding property, among those, but can be used very effective in paint of a coating with low viscosity, especially a photocatalyst coating with the low viscosity through water.

[0040]

[Example] Although an example etc. explains this invention concretely below, this invention is not restricted at all by the following examples. In the following examples, the hydrophilic property (wettability) of the painted surface which paints a photocatalyst coating and is obtained using the rate of crimp expanding of the fiber (yarn) which constitutes the set-up fiber layer of a fiber structure object, the water-retention ability of the reticulated welding layer in a set-up fiber layer, the amount of implications of a paint roller and discharge quantity, and the paint implement manufactured in the following examples, and the light catalytic ability (acetaldehyde resolution) of the painted surface of a photocatalyst coating were the followings, and it made, and they measured or evaluated.

[0041] (1) The rate of crimp expanding of the fiber (yarn) which constitutes the set-up fiber layer of a fiber structure object : after rolling round a line of thread until it became the skein of 5500dtex(es) with the skein ** machine, the 10g load was hung in the center of a lower limit of skein, this skein was fixed in the upper part, and where the load of 0.009 cN/dtex is applied, the temperature of 90 degrees C performed heat treatment for 30 minutes. Subsequently, after leaving and drying at a room temperature in the state of a no-load, Itonaga after neglect was measured for 5 minutes, having applied the 10g load again,

and this was set to L1 (mm). Next, it asked for the rate of crimp expanding by following formula **, having applied the 1kg load, having measured Itonaga after neglect for 30 seconds, and having used this as L2 (mm).

[0042]

[Equation 1]

Rate of crimp expanding (%) = {(L2-L1) /L2} x100 ** [0043] (2) Water retention ability of the reticulated welding layer in a set-up fiber layer : ground weave is sliced and removed from a reticulated welding layer, and it is cut in a predetermined dimension (size in every direction), build a test piece, measure the dry mass of the test piece, and set this to W1 (g), after mowing the bulky layer by the side of the front face in the set-up fiber layer of a fiber structure object. Next, after being immersed underwater and leaving the test piece (a part for a reticulated welding layer) for 3 minutes, it took out, the mass was measured, this was set to W2 (g), and it asked for water retention ability by following formula **.

[0044]

[Equation 2]

Water retention ability (twice) = W2/W1 ** [0045] (3) the amount of implications of a paint roller, and discharge quantity: -- amount of (i) implications: -- measure the dry mass of the body of a paint roller (a roller and handle) produced in the following example, and set this to (A) and (g). Subsequently, on a paint roller, water is lightly drawn through on a network until a liquid lappet is lost, after making it contain until it becomes at a saturation state, the mass is measured again, this is set to (B) and (g), it contains by following formula **, and an amount (C) is calculated.

(ii) -- discharge quantity: -- the glass side of 2 was painted 1m using the paint roller drawn through lightly until the liquid lappet was lost above (i), the mass (D) of the paint roller after this paint and (g) were measured, and it asked for discharge quantity (E) and (g) by following formula **.

[0046]

[Equation 3]

amount of implications (C), and (g) = -- (B)-(A) ** (discharge quantity E) (g) =(C)-(D) ** [0047] (4) The hydrophilic property of a painted surface (wettability) : the paint implement (a paint roller or a trowel

brush) produced in the following example was used, the photocatalyst coating was applied on the surface of the glass plate (10cmx10cm), it dried at 20 degrees C, and the photocatalyst coating layer whose thickness is about 2 micrometers was made to form. 1ml distilled water was dropped at the painted surface with the syringe, the breadth condition was observed by viewing, and the following valuation basis estimated.

O : the whole painted surface has got wet mostly, and if a glass plate is leaned, water will flow.

**: Semi-sphere-like waterdrop has adhered to the painted surface, and if a glass plate is leaned, it will hang down.

x: It is still almost spherical waterdrop, and if a glass plate is leaned, it will roll.

[0048] (5) Light catalytic ability of a painted surface (acetaldehyde cracking severity) : the paint implement (a paint roller or a trowel brush) produced in the following example was used, and the same photocatalyst coating as having used above (4) was applied on the surface of the glass plate (10cmx10cm), it dried at 20 degrees C, and the photocatalyst coating layer whose thickness is about 2 micrometers was made to form. Turn a painted surface up and the painted glass plate is held in the 5l. transparence container made from Pyrex (trademark). An acetaldehyde is poured in so that initial concentration may be set to 15 ppm there. It irradiates for 24 hours by the black light (3.0 mW/cm2) installed in the distance of 10cm of upper parts of a container. The acetaldehyde concentration 30 minutes, 2 hours, and 24 hours after exposure initiation is measured. From the initial concentration (C0) (15 ppm) of an acetaldehyde, and the concentration (ppm) at the time of each measurement (C1), acetaldehyde cracking severity was searched for by following formula **, and it considered as the index of light catalytic ability.

[0049]

[Equation 4]

acetaldehyde cracking severity (%) ={(C0-C1) /C0} x100} **

[0050] <<example 1>>

(1) Polyethylene terephthalate (among a phenol / tetrachloroethane of-the-same-quality amount mixed solvent) 0.68 is used as a heart component. Intrinsic viscosity measured at 30 degrees C = Ethylene-vinyl

alcohol system copolymer [content [ethylene] % of 40 mols, It extends, after using (melt index MI) =10] when measuring by the temperature of 190 degrees C, and 2160g of loads as a sheath component and carrying out compound spinning at a rate of heart component:sheath component =1:1 (mass ratio). The sheath-core mold compound spinning multifilament yarn of the thermal melting arrival nature of 155dtex(es)/48 filament was manufactured.

(2) False twist processing of the sheath-core mold compound spinning multifilament yarn obtained above (1) was carried out with number of false twists 2570 T/M, the one-step heater temperature of 120 degrees C, and the two-step heater temperature of 135 degrees C, and false twist finished yarn was manufactured. It was 17% when measured by the approach which described above the rate of crimp expanding of the false twist finished yarn obtained by this.

(3) Lengthen three false twist finished yarn (thermal melting arrival nature crimped staple) whose rates of crimp expanding obtained above (2) are 17%, arrange it, and use as yarn for piles. With the above mentioned yarn for piles at the same time it uses the seal knitting machine of the aperture of 19 inches (48.3cm), and 16 gages, ground weave knits, using regular polyester false twist finished yarn (330dtex) as yarn for ground weave and it performs **** The set-up fiber layer which consists of a cut pile was made to form in one side of ground weave, the thickness of the whole including a set-up fiber layer manufactured 10mm (height of about 9mm of a cut pile), and eyes manufactured the fiber structure object (seal knitting fabric) of 530 g/m2.

[0051] (4) After spraying water in the amount to which the rear face (field without a cut pile) of this knitting fabric is turned upwards, and water content becomes 30 mass % from a rear face with a spray method after refining the seal knitting fabric obtained above (3), it put into the dryer the condition (condition [having turned the rear face of knitting fabric upwards]) as it is, and hot blast processing was carried out for 2 minutes at 170 degrees C. The thickness of ground weave was [the height of 1mm and the whole set-up fiber layer (pile layer) of the fiber structure object acquired by this] 8mm. In the set-up fiber layer (pile layer), even height of about 4mm had become a reticulated welding layer by the partial welding of a thermal melting arrival nature crimped staple from the front face of ground weave, the high bulky layer

of the bulkiness whose thickness is about 4mm was formed on it (front-face side), and it was a thing equivalent to the fiber structure object A for paint implements of this invention.

(5) When measured by the approach which described above the water retention ability of the reticulated welding layer of the set-up fiber layer in the fiber structure object (the fiber structure object A for paint implements) acquired above (4), it was as being shown in the following table 1.

[0052] (6) The fiber structure object (the fiber structure object A for paint implements) acquired above (4) was cut out in the shape of a strip of paper in width of face of 2.5cm, and die length of 35cm, adhesives were applied to the rear face, the handle was attached and the paint roller was produced, after twisting around the front face of the cylindrical core (die-length x outer-diameter =15cmx1.7cm) made from polypropylene spirally and fixing to it. When measured by the approach which described above the amount of implications and discharge quantity of a paint roller which were obtained by this, it was as being shown in the following table 1.

(7) Moreover, the paint roller produced above (6) was used, and when the hydrophilic property (wettability) and light catalytic ability (acetaldehyde cracking severity) of a painted surface which paint a photocatalyst coating and are obtained by the above-mentioned approach were measured or evaluated, it was as being shown in the following table 1.

[0053] Example of <<comparison 1>>

(1) Lengthen three sheath-core mold compound spinning multifilament yarn of the thermal melting arrival nature manufactured by (1) of an example 1, arrange it, without performing false twist processing, use as yarn for piles, and make it be the same as that of (3) of an example 1 except it. The thickness of the whole including a set-up fiber layer which has the set-up fiber layer which consists of a cut pile on one side of ground weave manufactured 10mm (height of about 8mm of a cut pile), and eyes manufactured the fiber structure object (seal knitting fabric) of 500 g/m2. In addition, when the rate of crimp expanding of the sheath-core mold compound spinning multifilament yarn of the thermal melting arrival nature which does not perform crimp processing used as a cut pile was measured by the above-mentioned approach, they were 3% and a low value.

(2) Turn the rear face (field without a cut pile) of this knitting fabric upwards after refining the seal knitting fabric obtained above (1). Although it put into the dryer the condition (condition [having turned the rear face of knitting fabric upwards]) as it is and hot blast processing was carried out for 2 minutes at 170 degrees C after spraying water in the amount to which water content becomes 30 mass % from a rear face with a spray method When it is in the condition that the whole set-up fiber layer hardened, with the fiber structure object acquired by that cause, and there is no crimp in the cut pile which constitutes the set-up fiber layer and there is no contact between fiber both the reticulated welding layer by the partial welding of thermal melting arrival nature fiber (cut pile fiber), and a bulky bulky layer -- although -- it was not formed.

(3) When measured by the approach which used the fiber structure object acquired above (2), produced the paint roller like (6) of an example 1, and described above the amount of implications and discharge quantity of the paint roller, it was as being shown in the following table 1.

(4) Moreover, the paint roller produced above (3) was used, and when the hydrophilic property (wettability) and light catalytic ability (acetaldehyde cracking severity) of a painted surface which paint a photocatalyst coating and are obtained by the above-mentioned approach were measured or evaluated, it was as being shown in the following table 1.

[0054] Example of <<comparison 2>>

(1) Number of false twists 2570 T/M and one-step heater temperature were made into 120 degrees C, two-step heater temperature was made into ordinary temperature, false twist processing of the same sheath-core mold compound spinning multifilament yarn of thermal melting arrival nature as having manufactured by (1) of an example 1 was carried out, and false twist finished yarn was manufactured. When measured by the approach which described above the rate of crimp expanding of the false twist finished yarn obtained by this, they were 34% and a high value.

(2) Three false twist finished yarn (thermal melting arrival nature crimped staple) whose rates of crimp expanding obtained above (1) are 34% was lengthened, was arranged, and it used as yarn for piles, and except it, the thickness of the whole including a set-up fiber layer manufactured 10mm (height of about 9mm of a cut pile) like (3) of an

example 1, and eyes manufactured the fiber structure object (seal knitting fabric) of 510 g/m2.

(3) After spraying water in the amount to which water content becomes 30 mass % from the rear face of seal knitting fabric with a spray method like (4) of an example 1 after refining the seal knitting fabric obtained above (2), it put into the dryer the condition (condition [having turned the rear face of knitting fabric upwards]) as it is, and hot blast processing was carried out for 2 minutes at 170 degrees C. The thickness of ground weave was [the height of 1mm and the whole set-up fiber layer (pile layer) of the fiber structure object acquired by this] 7mm. In the set-up fiber layer (pile layer), even height of about 4mm serves as a reticulated welding layer by the partial welding of a thermal melting arrival nature crimped staple from the front face of ground weave, and the bulky layer of the bulkiness whose thickness is about 3mm was formed on it (front-face side).

(4) When measured by the approach which described above the water retention ability of the reticulated welding layer in the fiber structure object acquired above (3), it was as being shown in the following table 1.

(5) When measured by the approach which used the fiber structure object acquired above (3), produced the paint roller like (6) of an example 1, and described above the amount of implications and discharge quantity of the paint roller, it was as being shown in the following table 1.

(6) Moreover, the paint roller produced above (5) was used, and when the hydrophilic property (wettability) and light catalytic ability (acetaldehyde cracking severity) of a painted surface which paint a photocatalyst coating and are obtained by the above-mentioned approach were measured or evaluated, it was as being shown in the following table 1.

[0055] The example 1 of <<reference, and 2>>

(1) When measured by the approach which described above each amount of implications and discharge quantity about the paint roller ("AOZORA" by Otsuka brush incorporated company) (example 1 of reference) of marketing which comes to use the multiple fabric made from polyester, and the paint roller ("B roller" by Otsuka brush incorporated company; pile height of 13mm) (example 2 of reference) of marketing which comes to use high pile knitting, it was as being shown in the following table

1.

(2) Moreover, when the approach which described above the hydrophilic property (wettability) and light catalytic ability (acetaldehyde cracking severity) of a painted surface which painted the photocatalyst coating and were obtained by that cause by the two approaches of the above (1) which carried out paint roller use, and which were described above measured or estimated, it was as being shown in the following table 1.

[0056]

[Table 1]

	実施例1	比較例1	比較例2	参考例1[1]	参考例2[2]
・網状融着層 保水能（倍）	6.6	－[3]	7.4	－[3]	－[3]
・ペイントローラー： 含み量(g)	10.6	2.4	12.2	11.9	14.6
吐出量(g)	2.9	1.6	3.7	4.8	6.6
・塗装面の性質[4] 親水性（濡れ性）	○	×	△	△	△
ｱｾﾄｱﾙﾃﾞﾋﾄﾞ分解率(%) ３０分後	35	0	19	16	19
２時間後	47	0	23	28	24
２４時間後	92	2	48	58	50

1)ポリエステル製多重織物を塗装面とする市販のペイントローラー
2)ハイパイル編物を塗装面とする市販のペイントローラー
3)融着層を有せず
4)光触媒塗料を塗布した塗装面の性質

[0057] From the result of the above-mentioned table 1, the fiber structure object A for paint implements of an example 1 It has the set-up fiber layer which consists of fiber which contains in one side of ground weave the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass %. And when the reticulated welding layer formed of the partial welding of said thermal melting arrival nature crimped staple inside this set-up fiber layer exists and the bulky bulky layer exists in the front-face side of the set-up fiber layer outside this reticulated welding layer shows that the reticulated welding layer is excellent in water retention ability. and the paint roller produced from the fiber structure object A for paint

implements of an example 1 -- both the amount of implications, and discharge quantity -- although -- it is moderately high, and excels in the absorptivity ability and discharging performance of a coating, and a coating with the low viscosity of a photocatalyst coating etc. can be painted to a painted surface-ed at homogeneity, and a painted surface demonstrates a good photocatalyst operation by it. Furthermore, compared with the example 1 of reference, and the paint roller of marketing of two, each the hydrophilic property (getting wet) of a painted surface and light catalytic ability (acetaldehyde cracking severity) which applied the photocatalyst coating and were formed are high, and the paint roller produced from the fiber structure object A for paint implements of an example 1 is excellent in the spreading engine performance of a photocatalyst coating compared with the paint roller of the examples 1 and 2 of reference.

[0058] Since, as for the fiber structure object of the example 1 of a comparison, the set-up fiber layer is formed to it from the thermal melting arrival nature fiber whose rate of crimp expanding is 3% and which has not carried out crimp, a reticulated welding layer and a bulky bulky layer are not formed in a set-up fiber layer. and the paint roller which the fiber structure object of such an example 1 of a comparison had low water retention ability, and was moreover produced using the fiber structure object of the example 1 of a comparison -- both the amount of implications, and discharge quantity -- although -- it is very low and inferior to the absorptivity ability and discharging performance of a coating. Furthermore, a coating with the low viscosity of a photocatalyst coating etc. cannot be painted to a painted surface-ed at homogeneity, and a painted surface does not demonstrate a photocatalyst operation. Moreover, as for the fiber structure object of the example 2 of a comparison, the set-up fiber layer is formed from the crimped staple of the thermal melting arrival nature whose rate of crimp expanding is 34%. the paint roller produced using the fiber structure object of this example 2 of a comparison -- both the amount of implications, and discharge quantity -- although -- although it is high compared with an example 1, the paintwork to the painted surface-ed of a coating with the low viscosity of a photocatalyst coating etc. is not enough, and a photocatalyst operation of a painted surface is low compared with an example 1.

[0059] <<example 2>>

(1) After refining the seal knitting fabric obtained by (3) of an example 1, the front face of the set-up fiber layer which consists of the cut pile was heat-treated in contact time 5 seconds with a calender roller, pressing by linear pressure 50 kg/cm by the 190-degree C calender roller. With the fiber structure object acquired by this, the porosity skin with a thickness of 270 micrometers was formed near the front face of a set-up fiber layer, and it was a thing equivalent to the fiber structure object B for paint implements of this invention.

(2) When 20-degree C tap water was dropped at the front face of the porosity skin of the fiber structure object B for paint implements acquired above (1) by the syringe, it was absorbed inside in an instant.

(3) the fiber structure object B for paint implements acquired above (1) -- 15cmx10cm -- size -- judging -- a rear-face side -- adhesives -- applying -- the substrate made from vertical x horizontal x thickness =15cmx10cmx0.7cm polypropylene -- pasting up -- a trowel -- the brush was produced.

(4) the trowel produced above (3) -- the brush was used, and when the approach which described above the hydrophilic property (wettability) and light catalytic ability (acetaldehyde cracking severity) of a painted surface which painted the photocatalyst coating and were obtained by that cause by the above-mentioned approach measured or estimated, it was as being shown in the following table 2.

[0060] Example of <<comparison 3>>

(1) After refining the seal knitting fabric which has the set-up fiber layer which consists of a cut pile of 3% of rates of crimp expanding which were obtained by (1) of the example 1 of a comparison, and by which fiber structure object (seal knitting fabric) [crimp processing is not carried out on one side of ground weave, the front face of the set-up fiber layer which consists of the cut pile was heat-treated in contact time 5 seconds with a calender roller, pressing by linear pressure 50 kg/cm by the 190-degree C calender roller. When a photograph of the fiber structure object acquired by this was taken with the electron microscope, the skin with a thickness of 500 micrometers was formed near the front face of a set-up fiber layer.

(2) When 20-degree C tap water was dropped at the front face of the skin of the fiber structure object acquired above (1) by the syringe, it

resulted in crawling waterdrop rather, without being absorbed inside. This point shows that the set-up fiber layer (cut pile) of a fiber structure object will turn into a skin without the hole section at the time of carrying out heating weld of the front face of a set-up fiber layer if the rate of crimp expanding is formed from less than 5% of thermal melting arrival nature fiber (thermal melting arrival nature whose rate of crimp expanding is 3% in this example 3 of a comparison and which has not carried out crimp).

(3) the fiber structure object acquired above (1) -- 15cmx10cm -- size -- judging -- (3) of an example 2 -- the same -- carrying out -- a trowel -- the brush was produced.

(4) the trowel produced above (3) -- the brush was used, and when the approach which described above the hydrophilic property (wettability) and light catalytic ability (acetaldehyde cracking severity) of a painted surface which painted the photocatalyst coating and were obtained by that cause by the above-mentioned approach measured or estimated, it was as being shown in the following table 2.

[0061]

[Table 2]

	実施例2	比較例3
・塗装面の性質[1)]		
親水性（濡れ性）	○	×
ｱｾﾄｱﾙﾃﾞﾋﾄ分解率(%)		
３０分後	31	0
２時間後	46	0
２４時間後	91	1

1)光触媒塗料を塗布した塗装面の性質

[0062] The fiber structure object B for paint implements of this invention with which it has the set-up fiber layer which consisted of fiber which contains in one side of ground weave the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass %, and a porosity skin with a thickness [by the welding of a thermal melting arrival nature crimped staple] of 100-1000 micrometers exists in the front face of this set-up fiber layer is excellent in the absorptivity ability of a coating so that the result of the above-mentioned table 2 may show. and the trowel produced using

this fiber structure object B for paint implements -- paint implements, such as a brush, can paint a coating with the low viscosity of a photocatalyst coating etc. to a painted surface-ed at homogeneity, and demonstrate the photocatalyst operation with a good painted surface by it.

[0063]

[Effect of the Invention] The fiber structure object A for paint implements of this invention has the set-up fiber layer (pile) which consisted of fiber which contains in one side of ground weave the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate of 30 - 100 mass %. It has the specific structure where the reticulated welding layer formed of the partial welding of said thermal melting arrival nature crimped staple inside this set-up fiber layer exists, and a bulky bulky layer exists in the front-face side of the set-up fiber layer outside this reticulated welding layer. therefore, the paint roller produced using the fiber structure object A for paint implements of this invention, and it and a trowel -- this reticulated welding layer can fully hold a coating, and is excellent in the absorptivity ability and the maintenance engine performance of a coating with paint implements, such as a brush. And without excelling also in the outflow engine performance and spreading engine performance of a coating, and producing the ununiformity of a liquid lappet and paint film thickness etc., since a lot of coatings can be held in a reticulated welding layer and the bulky bulky layer exists in the upper part of a reticulated welding layer further, thickness is uniform and can form the good paint film of a result smoothly. And in this reticulated welding layer, since it has good resiliency by the partial welding of a thermal melting arrival nature crimped staple, control of the thrust to the paint implement at the time of painting is easy, and can form a beautiful paint film according to the homogeneity of thickness. And the fiber structure object A for paint implements equipped with the above mentioned outstanding property by the manufacture approach of this invention can be manufactured smoothly.

[0064] Furthermore, the fiber structure object B for paint implements of this invention has the set-up fiber layer which consisted of fiber which contains in one side of ground weave the thermal melting arrival nature crimped staple whose rate of crimp expanding is 5 - 30% at a rate

of 30 - 100 mass %, and a porosity skin with a thickness [by the welding of the thermal melting arrival nature crimped staple which constitutes a set-up fiber layer on the front face of this set-up fiber layer] of 100-1000 micrometers exists. and the paint roller produced using the fiber structure object B for paint implements, and it and a trowel -- in paint implements, such as a brush Since a coating particle is held at homogeneity at the hole section of a large number which exist in this porosity skin and solvents, such as water, are held good through a porosity skin at an inside crimped staple layer on the other hand, the paint implement which comes to use the fiber structure object B for paint implements of this invention and it is excellent in the maintenance ability of a coating. And if the fiber structure object B for paint implements is pressed at the time of paint, the solvent currently held at the crimped staple layer located inside a set-up fiber layer flows backwards on a front face, since the coating particle currently held at the hole section of a surface porosity skin is conveyed to a painted surface-ed, it excels in the discharging performance of a coating, and the good uniform paint film of a result can be formed in a painted surface-ed by it. Such a fiber structure object B for paint implements of this invention can be smoothly manufactured by the manufacture approach of this invention.

Brief Description of the Drawings]

[Drawing 1] It is the mimetic diagram (sectional view) showing an example of the fiber structure object A for paint implements of this invention.

[Drawing 2] It is the mimetic diagram (sectional view) showing another example of the fiber structure object A for paint implements of this invention.

[Drawing 3] It is the mimetic diagram (sectional view) showing an example of the fiber structure object B for paint implements of this invention.

[Description of Notations]

1 Ground Weave

2 Thermal Melting Arrival Nature Crimped Staple Which Constitutes Pile

3 Other Fiber Which Constitutes Pile

4 Set-up Fiber Layer Which Consists of Piles

4a The reticulated welding layer which exists inside the set-up fiber layer 4

4b The bulky layer which exists in the surface section of the set-up

fiber layer 4 on the outside of reticulated welding layer 4a

4c Porosity skin

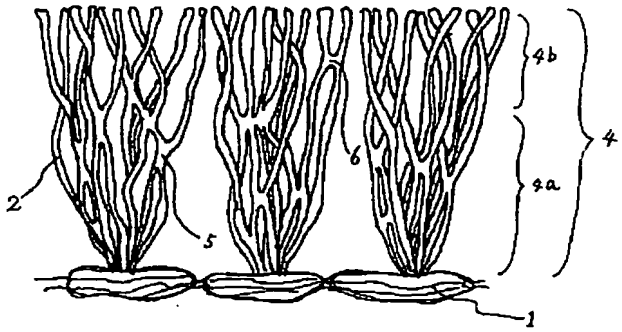
4d Non-welding fiber layer

5 Welding Section of Thermal Melting Arrival Nature Crimped Staple 2

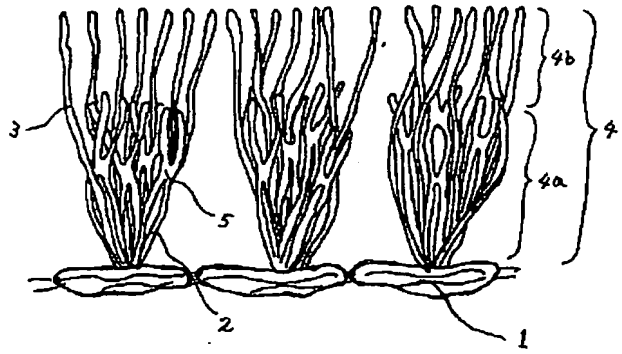
6 Welding Section of Thermal Melting Arrival Nature Crimped Staple 2

7 Hole Section

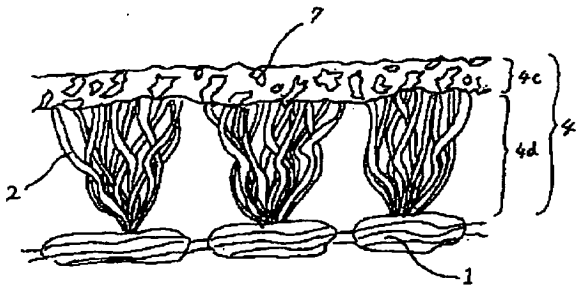
[Drawing 1]



[Drawing 2]



[Drawing 3]



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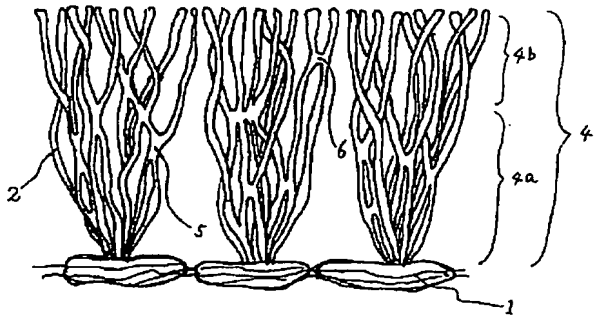
最終頁に続く

(54)【発明の名称】　塗装具用繊維構造体およびその製造方法

(57)【要約】
【課題】　塗料の吸収性（保持能）、流出性（吐出能）、塗膜の仕上性に優れる塗装具用の繊維構造体並びに該繊維構造体を用いた塗装具の提供。
【解決手段】　（Ａ）捲縮伸長率５～３０％の熱融着性捲縮繊維を３０～１００質量％で含む繊維からなる立設繊維層（パイル）を片面に有し、立設繊維層の内側に前記熱融着性捲縮繊維が部分融着してなる網状融着層が存在し、その外側の表面部にバルキーな嵩高層が存在する塗装具用繊維構造体、（Ｂ）捲縮伸長率５～３０％の熱融着性捲縮繊維を３０～１００質量％で含む繊維からなる立設繊維層（パイル）を片面に有し、立設繊維層の表面に該熱融着性捲縮繊維が融着してなる厚さ１００～１０００μｍの多孔質スキン層が存在する塗装具用繊維構造体並びに前記塗装具用繊維構造体（Ａ）または（Ｂ）を用いて作製したペイントローラーやコテ刷毛などの塗装具。



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【特許請求の範囲】

【請求項１】　地組織の片面に立設繊維層を有し、該立設繊維層は捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成されており、該立設繊維層は、その内側部分が前記熱融着性捲縮繊維の部分融着により形成された網状融着層をなし且つ該網状融着層の上部の外側部分がバルキーな嵩高層をなしていることを特徴とする塗装具用繊維構造体。

【請求項２】　立設繊維層の高さが３～２０ｍｍであり、［網状融着層の厚さ］：［嵩高層の厚さ］の比が９：１～１：９である請求項１に記載の塗装具用繊維構造体。

【請求項３】　網状融着層の保水能が、網状融着層を形成している繊維質量の４～１６倍である請求項１または２に記載の塗装具用繊維構造体。

【請求項４】　地組織の片面に立設繊維層を有し、該立設繊維層は捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成されており、立設繊維層の表面部分が、立設繊維層を構成する前記熱融着性捲縮繊維の融着による厚さ１００～１０００μｍの多孔質スキン層をなしていることを特徴とする塗装具用繊維構造体。

【請求項５】　多孔質スキン層を含めた立設繊維層の高さが２～１８ｍｍである請求項４に記載の塗装具用繊維構造体。

【請求項６】　立設繊維層を構成する熱融着性捲縮繊維が、低融点重合体と繊維形成性重合体からなり、繊維表面の少なくとも一部に低融点重合体が存在する複合紡糸繊維および／または混合紡糸繊維からなる捲縮繊維である請求項１～５のいずれか１項に記載の塗装具用繊維構造体。

【請求項７】　請求項１～６のいずれか１項に記載の塗装具用繊維構造体を塗装面として基材に取り付けてなるペイントローラーまたはコテ刷毛。

【請求項８】　光触媒塗料の塗装用である請求項７に記載のペイントローラーまたはコテ刷毛。

【請求項９】　捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成される立設繊維層を地組織の片面に有する繊維構造体に対して、立設繊維層を有していないもう片方の面を上に向けた状態で、該もう片方の面から水を噴霧した後、［前記熱融着性捲縮繊維の融点－５０（℃）］以上の温度で熱処理して立設繊維層の内側で熱融着性捲縮繊維を部分融着させて網状融着層を形成することを特徴とする請求項１に記載の塗装具用繊維構造体の製造方法。

【請求項１０】　捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成される立設繊維層を地組織の片面に有する繊維構造体を、立設繊維層の表面側から熱融着性捲縮繊維の融点以上の温度で熱圧着処理して表面部分の熱融着性捲縮繊維を融着させ、立設繊維層の表面に厚さ１００～１０００μｍの多孔質スキン層を形成することを特徴とする請求項４に記載の塗装具用繊維構造体の製造方法。

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【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は塗装具用の繊維構造体およびその製造方法に関する。より詳細には、本発明は、粘度の低い塗料、特に水および／またはアルコールを溶媒とする粘度の低い光触媒塗料の塗工に適する塗装具の作製に用いる繊維構造体およびその製造方法に関する。

【０００２】

【従来の技術】塗装具としては、刷毛、ペイントローラー、コテ刷毛などがあり、これらは被塗装面の種類や形状、塗工者の熟練度合いなどによって選定されている。なかでも、ペイントローラーは塗工業者の間で最もよく利用されている塗装具の一つである。従来汎用のペイントローラーは、軸の回りに回転するプラスチック製または紙製の芯材に、毛皮、合成繊維製パイル糸を植設した立毛織編物、不織布などを巻き付けることによって形成されている。これら従来のペイントローラーでは、塗装目的、塗料の種類などによって、毛皮の種類の選択、立毛織編物の立毛を構成する合成繊維の種類や立毛長の選定、不織布を構成する繊維の種類の選定などが必要であり、万能のペイントローラーというものはない。また、ペイントローラーの性能は、塗料の吸収性能を表す“含み”、塗料の流出性能を表す“吐き出し”および塗装の出来栄えを表す“仕上がり”によって評価されることが多いが、上記した従来のペイントローラーは、これらの性能を十分に満足することが困難であった。

【０００３】そこで、上記した塗料の吸収性能（“含み”）、塗料の流出性能（“吐き出し”）、塗装面の“仕上がり”などの向上を目的として、様々な形態のペイントローラーが提案されている。例えば、実開平２－４６７９号公報には、塗装作業によって受ける圧縮の繰り返しによってパイルが倒れて塗料の含浸性（塗料の吸収性能、“含み”）が短期間で損なわれないようにし、また地組織からのパイルの抜けを防止する目的で、低融点成分と高融点成分からなる低融点複合繊維をパイル構成繊維の１０％以上の割合で用いるハイパイル編地をつくり、そのパイル構成繊維同士を部分的に接着させたハイパイル編地をローラ芯に巻き付けたローラ状刷毛が記載されている。また、実開平２－１００６７４号公報には、塗装の仕上がりを良くする目的で、中空円筒状の芯材の外周に軟質発泡プラスチック製の円筒ロールを取り付け、該円筒ロールの表面に微細な単繊維を静電植毛すると共に円筒ロールの表面に切り込みを設けた塗装用ローラが記載されている。さらに、実開平４－９８４６８号公報には、塗料の吸着量の増大、塗料の流出の円滑化、塗料の洗浄の容易化を目的として、塗料不浸透性基

部上に、ポリウレタン開放気泡体などからなる網状塗料溜め組織を設け、さらにその上に柔軟な網状組織よりなる外層を網目部分で結合した塗料塗布器が記載されている。

【０００４】しかしながら、上記した実開平２－４６７９号公報に記載されているローラ状刷毛では、パイル構成繊維同士がパイル部の厚さ方向全体に亙って単にランダムに部分接着されているに過ぎず、パイル部が塗料溜めとしての機能に十分に有していないため、塗料の吸収性能（“含み”）が劣っており、液垂れを生じ易く、使用し辛いという問題がある。しかも、塗料を薄く均一に塗布しにくい。また、上記した実開平２－１００６７４号公報に記載されている塗装用ローラおよび実開平４－９８４６８号公報に記載されている塗料塗布器も、塗料の吸収性能（“含み”）、塗料の流出性能（“吐き出し”）、塗装面の“仕上がり”などの点で十分に満足のゆくものではない。すなわち、ペイントローラーなどの塗装具を用いて塗装を行うに当たっては、塗装具に塗料を付着させた塗料の垂れ（液垂れ）を防止するために、塗装具を例えばネット上に軽く押し当てて余分な塗料を除く準備動作を行った後に塗装を行うことが広く行われている。しかしながら、上記した公報などに記載されている従来のペイントローラーでは、塗料の保持能が十分ではなく、そのために前記した準備動作時に大半の塗料がペイントローラーから失われ易く、塗装作用を円滑に行うことが困難である。

【０００５】さらに、近年、アナターゼ型酸化チタンなどのいわゆる光触媒を含有する光触媒塗料が、その優れた大気汚染物質の分解作用、抗菌作用、消臭作用、防汚作用などにより注目を集めており、光触媒塗料やその塗装方法に関する提案が数多くなされている（例えば特開平１１－２４６７８７号公報、特開２０００－１２９１７４号公報、特開２０００－１８９８８８号公報、特開２０００－２７３３５５号公報など）。光触媒塗料は、前記した優れた諸特性によって、各種の建築物外壁、建築物の内壁、窓ガラスの外面や内面、橋梁、高速道路防音壁、鉄道車両や自動車の車体や窓ガラスの外面や内面、その他の広範な用途への施工が試みられている。光触媒塗料は、一般に水および／またはアルコールを媒体（溶媒）としていて、その粘度が極めて低い（水を媒体とするものでは例えば１ｍＰａ・ｓ程度のものもある）。そのため、ペイントローラーやコテ刷毛などのような塗装具において、塗料の吸収性能（“含み”）が低いと、光触媒塗料の塗布時に液垂れを生じ、使用し辛いという問題があり、しかも仕上がりの良好な塗膜を形成することができない。特に、光触媒塗料は、光触媒の機能を十分に発揮させるために薄く塗装することが要求されている。しかしながら、上記した従来のペイントローラーなどの塗装具は、上述のように、塗料の吸収性能（“含み”）が低く、十分な塗料を保持することが困難であり、それによって液垂れの問題が生じ易く、また塗料の吐き出しが円滑に行われず、しかも塗膜の厚さのコントロールが極めて困難であった。

【０００６】スプレー塗装による場合は、低粘度塗料を用いて薄く塗装することが可能であるが、塗料の飛散などにより歩留まりが極めて悪いため、高価な光触媒塗料の塗装には適していない。かかる点から、光触媒塗料などのような粘度の低い塗料を、液垂れ、塗膜の厚さ斑などを生ずることなく、良好な歩留りで、均一な厚さで薄く塗布することのできるペイントローラーやコテ刷毛などの塗装具、およびそのような塗装具に用いる素材の開発が求められていた。

【０００７】

【発明が解決しようとする課題】本発明の目的は、塗料の吸収性能（“含み”）、塗料の流出性能（“吐き出し”）および塗装面の仕上がり性能に優れていて、液垂れ、塗膜厚みの不均一などを生ずることなく、厚さが均一で、仕上がりの良好な塗膜を形成することのできる塗装具用の素材および該素材の製造方法、並びに該素材を用いてなるペイントローラーやコテ刷毛などの塗装具を提供することである。特に、本発明は、光触媒塗料などのような粘度の低い塗料を用いるときにも、液垂れや塗膜厚みの不均一などを生ずることなく、厚さが均一で、仕上がりの良好な、薄い塗膜を、円滑に形成することのできる塗装具用の素材、その製造方法、並びに該素材を用いてなるペイントローラーやコテ刷毛などの塗装具を提供することである。

【０００８】

【課題を解決するための手段】上記の目的を達成すべく本発明者らは鋭意検討を重ねてきた。その結果、織編地などの地組織の片面に、所定範囲の捲縮伸長率を有する熱融着性捲縮繊維を特定割合で含む繊維からなる立設繊維層（パイル層）を形成し、該立設繊維層の表面側では捲縮繊維同士を融着させずにバルキーな嵩高層とし、該嵩高層の内側に捲縮繊維同士を部分融着させた網状融着層を形成させて特定の繊維構造体を製造した。そして、それにより得られた繊維構造体の特性について種々調べたところ、該繊維構造体の前記網状融着層が塗料の保有能に優れていること、しかも熱融着性捲縮繊維の部分融着によって網状融着層に良好な弾力性を有すること、そのためその繊維構造体を用いてペイントローラーやコテ刷毛などの塗装具を作製すると、塗料の吸収性能（“含み”）、塗料の流出性能（“吐き出し”）および塗装面の仕上がり性能に優れる塗装具が得られ、液垂れ、塗膜厚みの不均一などを生ずることなく、厚さが均一で、仕上がりの良好な塗膜を形成できることを見出した。特に、立設繊維層の内側に前記した網状融着層を形成し、その外側にバルキーな嵩高層を形成したそのような繊維構造体は、光触媒塗料などのような低粘度の塗料の塗装するためのペイントローラーやコテ刷毛などの塗装具に

おける塗工面用素材として好適であることを見出した。そして、本発明者らは、そのような繊維構造体は、その製法の如何に拘わらず、前記した特定の構造を有している限りは、塗装具用の素材として適しているが、特に、織編地などの地組織の片面に熱融着性捲縮繊維を特定割合で含み所定範囲の捲縮伸長率を有する捲縮繊維よりなる立設繊維層（パイル層）を形成してなる繊維構造体の立設繊維層のないもう片方の面から水を噴霧した後に所定の温度で加熱することにより円滑に製造されることを見出した。

【０００９】さらに、本発明者らは、織編地などの地組織の片面に、所定範囲の捲縮伸長率を有する熱融着性捲縮繊維を特定割合で含む繊維からなる立設繊維層（パイル層）を形成した前記した繊維構造体において、立設繊維層の内側部分で捲縮繊維同士を部分融着させる上記した方式に代えて、立設繊維層の表面部分に、該捲縮繊維を融着させて塗料の通過し得る孔を有する多孔質スキン層を形成させる方式を採用した場合にも、塗装性能および塗装面の仕上がり性能に優れる塗装具用の素材が得られることを見出した。すなわち、立設繊維層の表面に熱融着性捲縮繊維の融着による多孔質スキン層を形成したこの繊維構造体では、該繊維構造体に塗料を付着させた際に、多孔質スキン層内に存在する多数の空孔部に塗料微粒子が均一に保持される。一方、水などの溶媒は多孔質スキン層を通って内側の捲縮繊維層に保持される。そして、塗装時に該繊維構造体が押圧されると、内側の捲縮繊維層に保持されている溶媒が表面に逆流して、表面の多孔質スキン層の空孔部に保持されていた塗料微粒子を被塗装面へと搬送して、被塗装面に均一な塗膜を形成することを見出した。そして、立設繊維層の該多孔質スキン層を有するこの繊維構造体も、光触媒塗料などのような、微細な塗料粒子を含む低粘度塗料を塗装するためのペイントローラーやコテ刷毛などの塗装具用の素材として特に適していることを見出した。そして、本発明者らは、そのような繊維構造体が、織編地などの地組織の片面に熱融着性捲縮繊維を特定割合で含み所定範囲の捲縮伸長率を有する捲縮繊維よりなる立設繊維層（パイル層）を形成してなる繊維構造体をその表面側から熱融着性捲縮繊維の融点以上の温度で熱圧着処理することによって、円滑に製造できることを見出し、それらの知見に基づいて本発明を完成した。

【００１０】すなわち、本発明は、（１）　地組織の片面に立設繊維層を有し、該立設繊維層は捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成されており、該立設繊維層は、その内側部分が前記熱融着性捲縮繊維の部分融着により形成された網状融着層をなし且つ該網状融着層の上部の外側部分がバルキーな嵩高層をなしていることを特徴とする塗装具用繊維構造体（以下これを「塗装具用繊維構造体Ａ」ということがある）である。

【００１１】そして、本発明は、（２）　立設繊維層の高さが３～２０ｍｍであり、［網状融着層の厚さ］：［嵩高層の厚さ］の比が９：１～１：９である前記（１）の塗装具用繊維構造体Ａ；および、（３）　網状融着層の保水能が、網状融着層を形成している繊維質量の４～１６倍である前記（１）または（２）の塗装具用繊維構造体Ａ；を好ましい態様として包含する。

【００１２】さらに、本発明は、（４）　地組織の片面に立設繊維層を有し、該立設繊維層は捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成されており、立設繊維層の表面部分が、立設繊維層を構成する前記熱融着性捲縮繊維の融着による厚さ１００～１０００μｍの多孔質スキン層をなしていることを特徴とする塗装具用繊維構造体（以下これを「塗装具用繊維構造体Ｂ」ということがある）である。

【００１３】そして、本発明は、（５）　多孔質スキン層を含めた立設繊維層の高さが２～１８ｍｍである前記（４）の塗装具用繊維構造体Ｂ；および、（６）　立設繊維層を構成する熱融着性捲縮繊維が、低融点重合体と繊維形成性重合体からなり、繊維表面の少なくとも一部に低融点重合体が存在する複合紡糸繊維および／または混合紡糸繊維からなる捲縮繊維である前記（１）～（３）のいずれかの塗装具用繊維構造体Ａ或いは前記（４）または（５）の塗装具用繊維構造体Ｂ；を好ましい態様として包含する。

【００１４】さらに、本発明は、（７）　前記（１）～（６）のいずれかの塗装具用繊維構造体Ａまたは塗装具用繊維構造体Ｂを塗装面として基材に取り付けてなるペイントローラーまたはコテ刷毛であり；（８）　光触媒塗料の塗装用である前記（７）のペイントローラーまたはコテ刷毛を好ましい態様として包含する。

【００１５】そして、本発明は、（９）　捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成される立設繊維層を地組織の片面に有する繊維構造体に対して、立設繊維層を有していないもう片方の面を上に向けた状態で、該もう片方の面から水を噴霧した後、［前記熱融着性捲縮繊維の融点－５０（℃）］以上の温度で乾熱処理して立設繊維層の内側で熱融着性捲縮繊維を部分融着させて網状融着層を形成することを特徴とする前記（１）の塗装具用繊維構造体Ａの製造方法；および、（１０）　捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成される立設繊維層を地組織の片面に有する繊維構造体を、立設繊維層の表面側から熱融着性捲縮繊維の融点以上の温度で熱圧着処理して表面部分の熱融着性捲縮繊維を融着させ、立設繊維層の表面に厚さ１００～１０００μｍの多孔質スキン層を形成することを特徴とする前記（４）の塗装具用繊維構造体Ｂの製造方法；である。

【００１６】
【発明の実施の形態】以下に本発明について詳細に説明する。本発明の塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂは、いずれも、地組織の片面に立設繊維層を有する繊維構造体をベースとする。立設繊維層は、多数のパイルから構成される層であって、立設繊維層を構成するパイルは、捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から形成されていることが必要である。本発明の塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂでは、立設繊維層を構成する繊維（パイル）の８０～１００％が捲縮伸長率５～３０％の熱融着性捲縮繊維からなることが好ましく、１００％（パイルの全量）が捲縮伸長率５～３０％の熱融着性捲縮繊維からなることがより好ましい。
【００１７】立設繊維層を構成する繊維（パイル）における熱融着性捲縮繊維の含有量が３０質量％未満であると、立設繊維層を構成する捲縮繊維間の融着が不十分となる。その結果、塗装具用繊維構造体Ａでは、立設繊維層の内側部分に繊維間の部分融着（すなわち、熱融着性捲縮繊維同士の部分融着および熱融着性捲縮繊維と他の繊維との部分融着）による網状融着層の形成が困難になり、塗料の吸収性能（“含み”）が低下し、しかも網状融着層の弾力性が低下する。また、塗装具用繊維構造体Ｂでは、立設繊維層の表面部分における多孔質スキン層の形成が不十分になり、表面の平滑状態が損なわれ、塗装面の仕上がりが悪くなる。
【００１８】立設繊維層を構成する繊維（パイル）の少なくとも一部を構成する熱融着性捲縮繊維としては、低融点重合体と繊維形成性重合体よりなり、繊維表面の少なくとも一部に低融点重合体が存在する複合紡糸繊維および／または混合紡糸繊維からなる捲縮繊維が好ましく用いられる。その場合に、該熱融着性捲縮繊維は、乾熱状態で１１０～１９０℃で自己融着または他の繊維に融着するか、および／または湿熱無緊張下で９５℃以上の熱水により軟化して自己融着または他の繊維に融着するものであることがより好ましい。
【００１９】熱融着性捲縮繊維が、前記した複合紡糸繊維または混合紡糸繊維である場合の複合形成または混合形態としては、例えば、繊維形成性重合体を芯成分とし低融点重合体を鞘成分とする芯鞘型、繊維形成性重合体を島成分とし低融点重合体を海成分とする海島型、繊維形成性重合体と低融点重合体とが貼合せ構造をなすサイドバイサイド型などを挙げることができ、そのうちでも芯鞘型または海島型であることが好ましい。
【００２０】熱融着性捲縮繊維として好ましく用いられる前記した複合紡糸繊維および混合紡糸繊維を構成する低融点重合体としては、例えば、エチレン－ビニルアルコール系共重合体、ポリエチレン、ポリプロピレンなどのオレフィン系重合体、ポリアミド系重合体などを挙げることができ、そのうちでもエチレン－ビニルアルコール系共重合体が親水性が高い点から好ましい。また、該複合紡糸繊維および混合紡糸繊維を構成する繊維形成性重合体としては、例えば、ポリエステル、ポリアミド、ポリプロピレンなどを挙げることができ、そのうちでもポリエステルが捲縮付与性が良好である点から好ましい。
【００２１】また、上述のように、立設繊維層を構成する熱融着性捲縮繊維は、その捲縮伸長率が５～３０％であることが必要である。熱融着性捲縮繊維の捲縮伸長率５％未満であると、立設繊維層において繊維（パイル）間の接触が不十分になる。その結果、塗装具用繊維構造体Ａでは、立設繊維層の内側に繊維の部分融着による網状融着層が形成されなくなり、塗料の吸収性能（“含み”）および網状融着層の弾力性が低下する。また、塗装具用繊維構造体Ｂでは、立設繊維層の表面における多孔質スキン層の形成が不十分になり、表面の平滑状態が損なわれ、塗装面の仕上がりが悪くなり、しかも多孔質スキン層の下の嵩高層のバルキー性が低くなり、塗料の吸収性能（“含み”）が低下して塗工性が不良になり、さらに塗装時の塗膜の厚みのコントロールが困難になる。一方、立設繊維層を構成する熱融着性捲縮繊維の捲縮伸長率が３０％を超えると、塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂのいずれの場合も、塗料の流出性能（“吐き出し”）が低下して、塗装性が不良になり、しかも塗膜の厚みのコントロールが困難になる。立設繊維層を構成する繊維（パイル）は、捲縮伸長率が１０～２０％の熱融着性捲縮繊維を用いて形成されていることが、塗料の吸収性能（“含み”）、流出性能（“吐き出し”）、塗膜のコントロールがより良好になる点から好ましい。なお、本明細書における「捲縮伸長率」とは、以下の実施例の項に記載した方法で測定した捲縮伸長率をいう。
【００２２】本発明の塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂでは、立設繊維層は構成する繊維（パイル）は、上記した熱融着性捲縮繊維とは異なる他の繊維を０～７０質量％の割合で含み得るが、他の繊維の種類は特に制限されず、例えば、ポリエステル、ポリアミド、ポリプロピレン、アクリル系重合体、ポリビニルアルコール、ポリ塩化ビニリデンなどの１種または２種以上からなる非熱融着性の捲縮または非捲縮の合成繊維、ビスコース、レーヨンなどの半合成繊維、綿、羊毛、絹などを挙げることができ、それらの１種または２種以上を用いることができる。立設繊維層を上記した熱融着性捲縮繊維と共に他の繊維を用いて形成する場合は、上記した繊維のうちで、ポリエステル繊維が捲縮特性、熱融着性および繊維との接着性の点から好ましく用いられる。立設繊維層を熱融着性捲縮繊維および他の繊維を併用して形成する場合は、両者が十分に混合分散しているようにすることが好ましい。
【００２３】立設繊維層（パイル部）を構成する熱融着

性捲縮繊維および他の繊維の単繊維繊度は、塗料の含み易さの点から、１～１５ｄｔｅｘであることが好ましく、３～７ｄｔｅｘであることがより好ましい。また、立設繊維層におけるパイル密度は、パイルの倒立防止、塗料の吸収性能（“含み”）、流出性能（“吐き出し”）、塗装の仕上がり、などの点から、繊維構造体１ｃｍ²当たり７０００～５００００本（単繊維）であることが好ましく、１００００～３００００本であることがより好ましい。さらに、立設繊維層は、高さの同じパイル（繊維）から形成しても、または高さの異なる複数のパイル（繊維）から形成してもいずれでもよい。但し、いずれの場合も立設繊維層の最表面部は高さが揃った状態にする必要がある。また、立設繊維層を構成する繊維（パイル）は、塗工性、塗膜の仕上がり、などの点から、カットパイル状であることが好ましい。

【００２４】また、本発明の塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂにおける地組織は、立設繊維層を構成するパイルの保持部、および本発明の塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂを塗装具基体に取り付けるための基部として機能する。塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂにおける地組織の種類は特に制限されず、織地、編地、ニードルパンチングや流体処理などにより絡合された不織布、およびそれらの２つ以上の組み合わせたもののいずれであってもよい。また、地組織を形成する繊維や糸の種類も特に制限されず、上記したような合成繊維、半合成繊維、天然繊維のいずれから形成されていてもよい。さらに、地組織の目付も特に制限されず、適宜調整することができる。本発明の塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂにおける立設繊維層は、上記したように、捲縮伸長率が３～１０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維（パイル）から構成されている必要があるが、地組織は熱融着性捲縮繊維を含んでいてもまたは含んでいないくてもよい。地組織が熱融着性捲縮繊維を含んでいる場合は、該熱融着性捲縮繊維が立設繊維層を構成する繊維（パイル）を地組織に融着固定してパイルの抜け防止機能を果たす。

【００２５】本発明の塗装具用繊維構造体Ａおよび塗装具用繊維構造体Ｂのベースをなす繊維構造体の製造方法は特に制限されず、地組織用の糸または繊維と、捲縮伸長率が３～１０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む立設繊維層（パイル）用の繊維（糸）を用いて、従来既知のパイル布帛の製造方法に準じて製造することができる。

【００２６】そして、本発明の塗装具用繊維構造体Ａでは、地組織の片面上に捲縮伸長率が３～１０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維（パイル）から構成される立設繊維層を有する繊維構造体において、立設繊維層の内側に熱融着性捲縮繊維の部分融着（すなわち熱融着性捲縮繊維同士の部分融着および／または熱融着性捲縮繊維と他の繊維との部分融着）により形成された網状融着層が存在し、該網状融着層の外側の立設繊維層の表面側にバルキーな嵩高層が存在する。

【００２７】以下に、図１および図２を参照して本発明の塗装具用繊維構造体Ａについて説明する。図１および図２は、本発明の塗装具用繊維構造体Ａの例を模式的に示した図（厚さ方向の断面図）である。本発明の塗装具用繊維構造体Ａが、図１および図２のものに何ら制限されないことはいうまでもない。図１および図２において、１は地組織、２はパイルを構成する熱融着性捲縮繊維、３はパイルを構成する他の繊維、４はパイルから構成される立設繊維層、４ａは立設繊維層４の内側に存在する網状融着層、４ｂは網状融着層４ａの外側で立設繊維層４の表面部に存在するバルキーな嵩高層、５および６は熱融着性捲縮繊維２の融着部を示す。図１には、立設繊維層４を構成する繊維（パイル）が熱融着性捲縮繊維２のみからなっている塗装具用繊維構造体Ａを示したが、立設繊維層４は熱融着性捲縮繊維の割合が上記した３０質量％以上である限りは、勿論、熱融着性捲縮繊維と他の繊維を併用して形成されていてもよい。また、図１の塗装具用繊維構造体Ａでは、立設繊維層４を構成する繊維（パイル）の高さは全体に等しくなっているが、図２の塗装具用繊維構造体Ａに例示するように、立設繊維層４は高さの異なる繊維（パイル）から形成してもよい。但し、その場合には、良好な塗装性を保つために、立設繊維層４の最表面でのパイル高さが同じになる（立設繊維層の表面が平坦になる）ようにすることが必要である。図２の塗装具用繊維構造体Ａは、高さの低い熱融着性捲縮繊維２とそれよりも高い他の繊維３をパイルとして用いて立設繊維層４を形成した例である。なお、図１に示すように、場合によっては、嵩高層４ｂにおいても、多少であれば熱融着性捲縮繊維が部分融着した融着部が存在しても構わない。

【００２８】図１の塗装具用繊維構造体Ａでは、その立設繊維層４における網状融着層４ａにおいて、熱融着性捲縮繊維２相互が捲縮により部分的に接触して、多数の融着部５と繊維の絡み合いが形成され、それによって網状融着層４ａではその繊維間隙が嵩高層４ｂにおける繊維間隙より微小化されている。また、図２の塗装具用繊維構造体Ａでは、その立設繊維層４における網状融着層４ａにおいて、熱融着性捲縮繊維２相互が部分的に接触して多数の融着部５および絡み合いが形成され、さらに熱融着性捲縮繊維２と他の繊維３とが熱融着性捲縮繊維の捲縮により部分的に接触して両繊維間に多数の融着部６や絡み合いが形成される。そして、それによって、網状融着層４ａではその繊維間隙が嵩高層４ｂにおける繊維間隙より微小化されている。その結果、図１および図２の塗装具用繊維構造体Ａでは、網状融着層４ａ部分に毛管現象が生じて、塗装具用繊維構造体Ａの表面から吸収された塗料が嵩高層４ｂを通って網状融着層４ａに速

やかに吸収され、しかもその微小化された繊維間隙により網状融着層４ａに塗料が良好に保持される。そして、塗工時に塗装具用繊維構造体Ａに押圧力が加わると、網状融着層４ａに保持されている塗料が嵩高層４ｂを構成している繊維（熱融着性捲縮繊維および／または他の繊維）を伝って再度表面に流れ、被塗装面に塗布される。さらに、熱融着性捲縮繊維２の部分融着によって網状融着層４ａには弾力性が付与されているので、塗装具用繊維構造体Ａに対する押圧の調整が容易になり、網状融着層４ａに保持されている塗料の吐き出し量を良好にコントロールすることができる。また、立設繊維層４の表面側に存在する嵩高層４ｂは、熱融着性捲縮繊維の部分融着がないか、または部分融着の少ない繊維（熱融着性捲縮繊維および／または他の繊維）によってバルキーな状態になっていて、しかもその繊維（パイル）高さが均一に揃えられているために、網状融着層４ａから流出してきた塗料が、被塗装面に均一に塗布される。そのため、この塗装具用繊維構造体Ａは、塗料の吸収性能（“含み”）、塗料の流出性能（“吐き出し”）および塗装面の仕上がり性能に優れており、液垂れ、塗膜厚みの不均一などを生ずることなく、厚さが均一で、仕上がりの良好な塗膜を形成することができ、特に光触媒塗料などのような低粘度の塗料の塗装するためのペイントローラーやコテ刷毛などの塗装具における塗工面用素材として適している。

【００２９】立設繊維層を構成する熱融着性捲縮繊維の種類、単繊維繊度、物性、塗装具用繊維構造体Ａを取り付ける塗装具の種類などに応じて調整し得るが、本発明の塗装具用繊維構造体Ａでは、網状融着層４ａの保水能が、網状融着層４ａを形成している繊維質量の４～１６倍、特に６～１０倍であることが、塗料の吸収性能（“含み”）、流出性能（“吐き出し”）、および塗膜の仕上がりなどの点から好ましく、そのような保水能は、網状融着層４ａにおける部分融着の程度を調整することにより得ることができる。なお、本明細書における網状融着層の保水能とは、以下の実施例の項に記載した方法で測定した保水能力を言う。

【００３０】また、本発明の塗装具用繊維構造体Ａでは、立設繊維層４の高さが一般に３～２０ｍｍであり、［網状融着層の厚さ］：［嵩高層の厚さ］：の比が９：１～１：９であることが、塗料の吸収性能（“含み”）、流出性能（“吐き出し”）、および塗膜の仕上がりなどの点から好ましい。

【００３１】本発明の塗装具用繊維構造体Ａは、上記した構造を有している限り、いずれの方法で製造してもよいが、例えば、以下の方法で円滑に製造することができる。製編織機、不織布製造装置などを使用して、シングル丸編地、ダブルラッセル編地、多重織物、積層不織布などの布帛を製造する際に、捲縮伸長率が３～１０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維（糸）をカットパイル糸として供給して、地組織の片面上に捲縮伸長率が３～１０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維（カットパイル）よりなる立設繊維層を有する繊維構造体を製造する。次いで、繊維構造体のカットパイル糸を毛割機を用いて開繊した後、立設繊維層のないもう片方の面（裏面）を上側に向けて、該裏面より水を繊維構造体の質量に対して７０～１５０質量％の割合で噴霧した後、［熱融着性捲縮繊維の融点－５０（℃）］以上の温度で乾熱処理（熱風処理等）する。それによって、立設繊維層の内側に網状融着層が存在し、網状融着層の外側の立設繊維層の表面側にバルキーな嵩高層が存在する本発明の塗装具用繊維構造体Ａが得られる。

【００３２】上記した方法では、立設繊維層（カットパイル）のない裏面を上に向け、立設繊維層（カットパイル）のある面を下にして該裏面から水を噴霧することにより、裏面から噴霧された水が地組織を通って立設繊維層を構成するカットパイルの先端付近へと移行（流下）し、カットパイルの先端付近は水分に富んだ状態となり、またカットパイルの根元付近や中間部分は水分の少ない状態となる。そしてその状態で乾熱処理することにより、水分を多く含むカットパイルの先端部分は水分の蒸発潜熱によって加熱が抑制されて熱融着性捲縮繊維の軟化や溶融が防止されて、カットパイルの先端部分（立設繊維層の表面側）はバルキーな嵩高層となる。一方、カットパイルの根元や中間部分は水分が少ないことにより、加熱時に熱融着性捲縮繊維が軟化または溶融し、繊維間の部分融着が生じて、立設繊維層の内側に網状融着層が形成される。

【００３３】また、本発明の塗装具用繊維構造体Ｂでは、地組織の片面上に捲縮伸長率が３～１０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維（パイル）から構成される立設繊維層を有する繊維構造体において、立設繊維層の表面に、立設繊維層を構成する前記熱融着性捲縮繊維の融着による厚さ１００～１０００μｍの多孔質スキン層が存在している。

【００３４】以下に、図３を参照して本発明の塗装具用繊維構造体Ｂについて説明する。図３は、本発明の塗装具用繊維構造体Ｂの例を模式的に示した図（厚さ方向の断面図）である。本発明の塗装具用繊維構造体Ｂは図３のものに何ら制限されるものではない。図３において、１は地組織、２はパイルを構成する熱融着性捲縮繊維、４はパイルから構成される立設繊維層、４ｃは立設繊維層４を構成する熱融着性捲縮繊維２の表面部分での融着によって形成された多孔質スキン層、４ｄは非融着繊維層、７は多孔質スキン層４ｃにおける空孔部を示す。図３には、立設繊維層４を構成する繊維（パイル）が熱融着性捲縮繊維２のみからなっている塗装具用繊維構造体Ｂを示したが、立設繊維層４は熱融着性捲縮繊維の割合が上記した３０質量％以上である限りは、勿論、熱融着

性捲縮繊維と他の繊維を併用して形成されていてもよい。

【００３５】図３の塗装具用繊維構造体Ｂでは、塗装具用繊維構造体Ｂの表面に塗料を施すと、塗料微粒子が多孔質スキン層４ｃに存在する多数の空孔部７に保持される。それと同時に、水などの媒体は、空孔部７を通って、多孔質スキン層４ｃの内側に位置する非融着繊維層４ｄに速やかに到達し、該非融着繊維層４ｄに保持される。そして、塗工時に塗装具用繊維構造体Ｂに押圧力が加わると、非融着繊維層４ｄに保持されている媒体が多孔質スキン層４ｃ側へと逆流し、空孔部７に保持されている塗料微粒子を運んで被塗装面に均一な塗膜を形成する。塗装具用繊維構造体Ｂの表面は多孔質スキン層４ｃにより平坦な状態になっているので、この点によっても被塗装面に均一な塗膜を形成することができる。したがって、塗装具用繊維構造体Ｂも、塗装具用繊維構造体Ａと同様に、塗料の吸収性能（“含み”）、塗料の流出性能（“吐き出し”）および塗装面の仕上がり性能に優れており、液垂れ、塗膜厚みの不均一などを生ずることなく、厚さが均一で、仕上がりの良好な塗膜を形成することができ、特に光触媒塗料などのような低粘度の塗料の塗装するためのペイントローラーやコテ刷毛などの塗装具における塗工面用素材として有効である。

【００３６】塗装具用繊維構造体Ｂでは、上記のように、その表面の多孔質スキン層の厚さが１００～１０００μｍであることが必要であり、２５０～６００μｍであることが好ましい。多孔質スキン層の厚さが１００μｍ未満であると、表面の平坦性が失われて、厚さの均一な塗膜を形成しにくくなる。一方、多孔質スキン層の厚さが１０００μｍを超えると、多孔質スキン層の内側の非融着繊維層の厚さが相対的に低減するため、塗料の吸収性能が低下して、液垂れ、塗膜の不均一などを生ずる。また、塗装具用繊維構造体Ｂの多孔質スキン層は、表面に開放した孔径約５～９０μｍ程度の微細な空孔部を、１ｃｍ²当たり２０００～５０００個程度有していることが、塗料の吸収性能および流出性能の点から好ましい。さらに、塗装具用繊維構造体Ｂでは、塗料の吸収性能、流出性能、塗装面の仕上がりなどの点から、多孔質スキン層を含めた立設繊維層の高さが厚さが２～１８ｍｍであることが好ましく、５～１０ｍｍであることがより好ましい。

【００３７】本発明の塗装具用繊維構造体Ｂは、上記した構造を有している限り、いずれの方法で製造してもよいが、捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成される立設繊維層を地組織の片面に有する繊維構造体を、立設繊維層の表面側から熱融着性捲縮繊維の融点以上の温度で熱圧着処理して表面部分の熱融着性捲縮繊維を融着させ、立設繊維層の表面に厚さ１００～１０００μｍの多孔質スキン層を形成させる方法によって円滑に製造することができる。

【００３８】本発明の塗装具用繊維構造体Ａまたは塗装具用繊維構造体Ｂは、ペイントローラー、コテ刷毛、塗装ブラシなどの塗装具用の素材として有効に使用することができる。ペイントローラーの場合は、例えば、本発明の塗装具用繊維構造体Ａまたは塗装具用繊維構造体Ｂを短冊状に切断し、裏面に接着剤を塗布して、ローラー用芯材の回りに螺旋状に巻き付けて固定する方法、本発明の塗装具用繊維構造体Ａまたは塗装具用繊維構造体Ｂを長方形に切断して裏面に接着剤を塗布してローラー用芯材を縦長に包囲するようにして巻いて固定する方法などを採用して製造することができる。また、本発明の塗装具用繊維構造体Ａまたは塗装具用繊維構造体Ｂを、表面がフラットな板状物（直方体状物）に貼り付けることによって、塗装用のコテ刷毛を製造することができる。さらに、本発明の塗装具用繊維構造体Ａまたは塗装具用繊維構造体Ｂを用いてブラシ状の塗装具を製造してもよい。

【００３９】塗装具用繊維構造体Ａまたは塗装具用繊維構造体Ｂを用いて製造したペイントローラー、コテ刷毛などの塗装具は、塗料の吸収性能（“含み”）、塗料の流出性能（“吐き出し”）、塗装面の仕上がり性能に優れており、そのような優れた特性を活かして各種塗料の塗装に用いることができ、そのうちでも粘度の低い塗料、特に水を媒体とする粘度の低い光触媒塗料の塗装に極めて有効に使用することができる。

【００４０】

【実施例】以下に本発明を実施例などにより具体的に説明するが、本発明は以下の例により何ら制限されない。以下の例において、繊維構造体の立設繊維層を構成する繊維（糸）の捲縮伸長率、立設繊維層における網状融着層の保水能、ペイントローラーの含み量および吐出量、以下の例で製造した塗装具を用いて光触媒塗料を塗装して得られる塗装面の親水性（濡れ性）、光触媒塗料の塗装面の光触媒性能（アセトアルデヒド分解能）は、以下のようにして測定または評価した。

【００４１】（ｌ）繊維構造体の立設繊維層を構成する繊維（糸）の捲縮伸長率：カセ取機で５５００ｄｔｅｘのカセとなるまで糸条を巻き取った後、カセの下端中央に１０ｇの荷重を吊るし、上部でこのカセを固定して、０．００９ｃＮ／ｄｔｅｘの荷重がかかった状態で９０℃の温度で３０分間熱処理を行った。次いで、無荷重状態で室温で放置して乾燥した後、再び１０ｇの荷重をかけて５分間放置後の糸長を測定、これをL_1（ｍｍ）とした。次に、１ｋｇの荷重をかけ、３０秒間放置後の糸長を測定し、これをL_2（ｍｍ）として、下記の数式①により捲縮伸長率を求めた。

【００４２】

【数１】

15　　16

捲縮伸長率（％）＝｛（L_2-L_1）／L_2｝×１００　　①

【００４３】（２）立設繊維層における網状融着層の保水能：繊維構造体の立設繊維層における表面側の嵩高層を刈り取った後、網状融着層から地組織をスライスして除き、それを所定の寸法（縦横サイズ）に切断して試験片をつくり、その試験片の乾燥質量を測定し、これをW_1（ｇ）とする。次に、その試験片（網状融着層部分）を水中に浸漬して、３分間放置した後、取り出してその質量を測定し、これをW_2（ｇ）とし、以下の数式②により保水能を求めた。

【００４４】

【数２】

保水能（倍）＝W_2／W_1　　②

【００４５】（３）ペイントローラーの含み量および吐出量：

（ｉ）含み量：下記の例で作製したペイントローラー本体（ローラーとハンドル）の乾燥質量を測定して、これを（Ａ）（ｇ）とする。次いで、ペイントローラーに水を飽和状態になるまで含ませた後、液垂れがなくなるまでネット上で軽くしごいて再度その質量を測定し、これを（Ｂ）（ｇ）とし、以下の数式③により含み量（Ｃ）を求める。

（ii）吐出量：上記（ｉ）で液垂れがなくなるまで軽くしごいたペイントローラーを用いて１m^2のガラス面を塗装し、該塗装後のペイントローラーの質量（Ｄ）（ｇ）を測定して、以下の数式④により吐出量（Ｅ）（ｇ）を求めた。

【００４６】

【数３】

含み量（Ｃ）（ｇ）＝（Ｂ）－（Ａ）　　③

吐出量（Ｅ）（ｇ）＝（Ｃ）－（Ｄ）　　④

【００４７】（４）塗装面の親水性（濡れ性）：下記の＊例で作製した塗装具（ペイントローラーまたはコテ刷毛）を使用して、光触媒塗料をガラス板（１０ｃｍ×１０ｃｍ）の表面に塗布し、２０℃で乾燥して、厚みが約２μｍの光触媒塗料層を形成させた。その塗装面に、注射器により１ｍｌの蒸留水を滴下し、その広がり具合を目視により観察して、下記の評価基準により評価した。

○：塗装面の全体がほぼ濡れており、ガラス板を傾けると水が流れる。

△：塗装面に半球状の水滴が付着しており、ガラス板を傾けると垂れる。

×：ほぼ球状の水滴のままであり、ガラス板を傾けると転がる。

【００４８】（５）塗装面の光触媒性能（アセトアルデヒド分解率）：下記の例で作製した塗装具（ペイントローラーまたはコテ刷毛）を使用して、上記（４）で用いたのと同じ光触媒塗料をガラス板（１０ｃｍ×１０ｃｍ）の表面に塗布し、２０℃で乾燥して、厚みが約２μｍの光触媒塗料層を形成させた。塗装したガラス板を、塗装面を上にして５リットルのパイレックス（登録商標）製透明容器に収容し、そこに初期濃度が１５ｐｐｍになるようにアセトアルデヒドを注入し、容器の上方１０ｃｍの距離に設置したブラックライト（３．０ｍＷ／ｃm^2）で２４時間照射し、照射開始から３０分後、２時間後および２４時間後におけるアセトアルデヒド濃度を測定し、アセトアルデヒドの初期濃度（C_0）（１５ｐｐｍ）と各測定時の濃度（C_1）（ｐｐｍ）から、下記の数式⑤によりアセトアルデヒド分解率を求めて、光触媒性能の指標とした。

【００４９】

【数４】

アセトアルデヒド分解率（％）＝｛（C_0-C_1）／C_0｝×１００）　　⑤

【００５０】《実施例１》

（１）　ポリエチレンテレフタレート（フェノール／テトラクロロエタン等質量混合溶媒中、３０℃で測定した固有粘度＝０．６８）を芯成分とし、エチレン－ビニルアルコール系共重合体［エチレン含有量４０モル％、温度１９０℃、荷重２１６０ｇで測定したときのメルトインデックス（ＭＩ）＝１０］を鞘成分とし、芯成分：鞘成分＝１：１（質量比）の割合で複合紡糸した後、延伸して、１５５ｄｔｅｘ／４８フィラメントの熱融着性の芯鞘型複合紡糸マルチフィラメント糸を製造した。

（２）　上記（１）で得られた芯鞘型複合紡糸マルチフィラメント糸を、仮撚数２５７０Ｔ／Ｍ、１段ヒーター温度１２０℃、２段ヒーター温度１３５℃で仮撚加工して仮撚加工糸を製造した。これにより得られた仮撚加工糸の捲縮伸長率を上記した方法で測定したところ１７％であった。

（３）　上記（２）で得られた捲縮伸長率が１７％の仮撚加工糸（熱融着性捲縮繊維）を３本引き揃えてパイル用糸として用い、レギュラーポリエステル仮撚加工糸（３３０ｄｔｅｘ）を地組織用糸として用いて、口径１９インチ（４８．３ｃｍ）、１６ゲージのシール編機を使用して、地組織の編み立てを行うと同時に、前記したパイル用糸によって、カットパイルよりなる立設繊維層を地組織の片面に形成させて、立設繊維層を含めた全体の厚みが１０ｍｍ（カットパイルの高さ約９ｍｍ）、目付が５３０ｇ／m^2の繊維構造体（シール編地）を製造した。

【００５１】（４）　上記（３）で得られたシール編地を精練した後、該編地の裏面（カットパイルのない面）を上に向けて、裏面よりスプレー方式により含水率が３０質量％になる量で水を噴霧した後、そのままの状態（編地の裏面を上に向けたままの状態）で乾燥機に入れて１７０℃で２分間熱風処理した。これにより得られた繊維構造体は、地組織の厚さが１ｍｍ、および立設繊維

層（パイル層）全体の高さが８ｍｍであった。立設繊維層（パイル層）では、地組織の表面から高さ約４ｍｍまでが熱融着性捲縮繊維の部分融着による網状融着層となっており、その上（表面側）に厚さが約４ｍｍのバルキー性の高い嵩高層が形成されており、本発明の塗装具用繊維構造体Ａに相当するものであった。

（５）　上記（４）で得られた繊維構造体（塗装具用繊維構造体Ａ）における立設繊維層の網状融着層の保水能を上記した方法で測定したところ、下記の表１に示すとおりであった。

【００５２】（６）　上記（４）で得られた繊維構造体（塗装具用繊維構造体Ａ）を幅２．５ｃｍ、長さ３５ｃｍに短冊状に裁断し、その裏面に接着剤を塗布して、ポリプロピレン製円筒状コア（長さ×外径＝１５ｃｍ×１．７ｃｍ）の表面に螺旋状に巻き付け、固定した後、ハンドルを取り付けてペイントローラーを作製した。これにより得られたペイントローラーの含み量および吐出量を上記した方法で測定したところ、下記の表１に示すとおりであった。

（７）　また、上記（６）で作製したペイントローラーを使用して、上記した方法で光触媒塗料を塗装して得られる塗装面の親水性（濡れ性）および光触媒性能（アセトアルデヒド分解率）を測定または評価したところ、下記の表１に示すとおりであった。

【００５３】《比較例１》

（１）　実施例１の（１）で製造した熱融着性の芯鞘型複合紡糸マルチフィラメント糸を仮撚加工を施さずに３本引き揃えてパイル用糸として用いて、それ以外は実施例１の（３）と同様にして、カットパイルよりなる立設繊維層を地組織の片面に有する、立設繊維層を含めた全体の厚みが１０ｍｍ（カットパイルの高さ約８ｍｍ）、目付が５００ｇ／ｍ²の繊維構造体（シール編地）を製造した。なお、カットパイルとして用いた捲縮加工を施さない熱融着性の芯鞘型複合紡糸マルチフィラメント糸の捲縮伸長率は、上記した方法で測定したところ３％と低い値であった。

（２）　上記（１）で得られたシール編地を精練した後、該編地の裏面（カットパイルのない面）を上に向けて、裏面よりスプレー方式により含水率が３０質量％になる量で水を噴霧した後、そのままの状態（編地の裏面を上に向けたままの状態）で乾燥機に入れて１７０℃で２分間熱風処理したが、それにより得られた繊維構造体では、立設繊維層全体が硬化した状態となっており、立設繊維層を構成しているカットパイルに捲縮がなく繊維間の接触がないことにより、熱融着性繊維（カットパイル繊維）の部分融着による網状融着層およびバルキーな嵩高層のいずれもが形成されなかった。

（３）　上記（２）で得られた繊維構造体を使用して、実施例１の（６）と同様にしてペイントローラーを作製し、そのペイントローラーの含み量および吐出量を上記した方法で測定したところ、下記の表１に示すとおりであった。

（４）　また、上記（３）で作製したペイントローラーを使用して、上記した方法で光触媒塗料を塗装して得られる塗装面の親水性（濡れ性）および光触媒性能（アセトアルデヒド分解率）を測定または評価したところ、下記の表１に示すとおりであった。

【００５４】《比較例２》

（１）　実施例１の（１）で製造したのと同じ熱融着性の芯鞘型複合紡糸マルチフィラメント糸を、仮撚数２５７０Ｔ／Ｍ、１段ヒーター温度を１２０℃、２段ヒーター温度を常温にして仮撚加工して仮撚加工糸を製造した。これにより得られた仮撚加工糸の捲縮伸長率を上記した方法で測定したところ３４％と高い値であった。

（２）　上記（１）で得られた捲縮伸長率が３４％の仮撚加工糸（熱融着性捲縮繊維）を３本引き揃えてパイル用糸として用い、それ以外は実施例１の（３）と同様にして、立設繊維層を含めた全体の厚みが１０ｍｍ（カットパイルの高さ約９ｍｍ）、目付が５１０ｇ／ｍ²の繊維構造体（シール編地）を製造した。

（３）　上記（２）で得られたシール編地を精練した後、実施例１の（４）と同様にシール編地の裏面よりスプレー方式により含水率が３０質量％になる量で水を噴霧した後、そのままの状態（編地の裏面を上に向けたままの状態）で乾燥機に入れて１７０℃で２分間熱風処理した。これにより得られた繊維構造体は、地組織の厚さが１ｍｍ、および立設繊維層（パイル層）全体の高さが７ｍｍであった。立設繊維層（パイル層）では、地組織の表面から高さ約４ｍｍまでが熱融着性捲縮繊維の部分融着による網状融着層となっており、その上（表面側）に厚さが約３ｍｍのバルキー性の嵩高層が形成されていた。

（４）　上記（３）で得られた繊維構造体における網状融着層の保水能を上記した方法で測定したところ、下記の表１に示すとおりであった。

（５）　上記（３）で得られた繊維構造体を使用して、実施例１の（６）と同様にしてペイントローラーを作製し、そのペイントローラーの含み量および吐出量を上記した方法で測定したところ、下記の表１に示すとおりであった。

（６）　また、上記（５）で作製したペイントローラーを使用して、上記した方法で光触媒塗料を塗装して得られる塗装面の親水性（濡れ性）および光触媒性能（アセトアルデヒド分解率）を測定または評価したところ、下記の表１に示すとおりであった。

【００５５】《参考例１および２》

（１）　ポリエステル製多重織物を用いてなる市販のペイントローラー（大塚刷毛株式会社製「ＡＯＺＯＲＡ」）（参考例１）、およびハイパイル編物を用いてなる市販のペイントローラー（大塚刷毛株式会社製「Ｂロ

ーラー」；パイル高さ１３ｍｍ）（参考例２）について、それぞれの含み量および吐出量を上記した方法で測定したところ、下記の表１に示すとおりであった。

（２）　また、上記（１）の２つのペイントローラー使用して、上記した方法で光触媒塗料を塗装し、それによ＊り得られた塗装面の親水性（濡れ性）および光触媒性能（アセトアルデヒド分解率）を上記した方法で測定または評価したところ、下記の表１に示すとおりであった。

【００５６】

【表１】

	実施例１	比較例１	比較例２	参考例１[1]	参考例２[2]
・網状融着層 保水能（倍）	6.6	－[3]	7.4	－[3]	－[3]
・ペイントローラー： 含み量（g）	10.6	2.4	12.2	11.9	14.6
吐出量（g）	2.9	1.6	3.7	4.8	6.6
・塗装面の性質[4] 親水性（濡れ性）	○	×	△	△	△
アセトアルデヒド分解率（%） ３０分後	35	0	19	16	19
２時間後	47	0	23	28	24
２４時間後	92	2	48	58	50

1)ポリエステル製多重織物を塗装面とする市販のペイントローラー
2)ハイパイル編物を塗装面とする市販のペイントローラー
3)融着層を有せず
4)光触媒塗料を塗布した塗装面の性質

【００５７】上記の表１の結果から、実施例１の塗装具用繊維構造体Ａは、地組織の片面に捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成される立設繊維層を有し、かつ該立設繊維層の内側に前記熱融着性捲縮繊維の部分融着により形成された網状融着層が存在し、該網状融着層よりも外側の立設繊維層の表面側にバルキーな高高層が存在していることによって、その網状融着層は保水能に優れていることがわかる。そして、実施例１の塗装具用繊維構造体Ａから作製したペイントローラーは、含み量および吐出量のいずれもが適度に高く、塗料の吸収性能および吐出性能に優れており、また光触媒塗料などのような粘度の低い塗料を被塗装面に均一に塗装でき、それによって塗装面が良好な光触媒作用を発揮する。さらに、実施例１の塗装具用繊維構造体Ａから作製したペイントローラーは、参考例１および２の市販のペイントローラーに比べて、光触媒塗料を塗布して形成された塗装面の親水性（濡れ）および光触媒性能（アセトアルデヒド分解率）がいずれも高くなっており、参考例１および２のペイントローラーに比べて光触媒塗料の塗布性能に優れている。

【００５８】それに対して、比較例１の繊維構造体は、その立設繊維層が捲縮伸長率が３％の捲縮していない熱融着性繊維から形成されているために、立設繊維層に網状融着層とバルキーな高高層が形成されない。そして、そのような比較例１の繊維構造体は保水能が低く、しかも比較例１の繊維構造体を用いて作製したペイントローラーは、含み量および吐出量のいずれもが極めて低く、塗料の吸収性能および吐出性能に劣っている。さらに、光触媒塗料などのような粘度の低い塗料を被塗装面に均一に塗装できず、塗装面が光触媒作用を発揮しない。また、比較例２の繊維構造体は、その立設繊維層が捲縮伸長率が３４％の熱融着性の捲縮繊維から形成されていて、該比較例２の繊維構造体を用いて作製したペイントローラーは含み量および吐出量のいずれもが実施例１に比べて高いが、光触媒塗料などのような粘度の低い塗料の被塗装面への塗装性が十分ではなく、実施例１に比べて、塗装面の光触媒作用が低い。

【００５９】《実施例２》

（１）　実施例１の（３）で得られたシール編地を精練した後、そのカットパイルよりなる立設繊維層の表面を、１９０℃のカレンダーローラーにより線圧５０ｋｇ／ｃｍで押圧しながらカレンダーローラーとの接触時間５秒で熱処理した。これにより得られた繊維構造体では、立設繊維層の表面付近に厚さ２７０μｍの多孔質スキン層が形成されており、本発明の塗装具用繊維構造体Ｂに相当するものであった。

（２）　上記（１）で得られた塗装具用繊維構造体Ｂの多孔質スキン層の表面に２０℃の水道水をスポイトにて滴下したところ、瞬時に内部に吸収された。

（３）　上記（１）で得られた塗装具用繊維構造体Ｂを、１５ｃｍ×１０ｃｍにサイズに裁断し、裏面側に接着剤を塗布して、縦×横×厚さ＝１５ｃｍ×１０ｃｍ×０．７ｃｍのポリプロピレン製の基板に接着してコテ刷

毛を作製した。

（４）　上記（３）で作製したコテ刷毛を使用して、上記した方法で光触媒塗料を塗装し、それにより得られた塗装面の親水性（濡れ性）および光触媒性能（アセトアルデヒド分解率）を上記した方法で測定または評価したところ、下記の表２に示すとおりであった。

【００６０】《比較例３》

（１）　比較例１の（１）で得られた繊維構造体（シール編地）［捲縮加工されていない捲縮伸長率３％のカットパイルよりなる立設繊維層を地組織の片面に有するシール編地）を精練した後、そのカットパイルよりなる立設繊維層の表面を、１９０℃のカレンダーローラーにより線圧５０ｋｇ／ｃｍで押圧しながらカレンダーローラーとの接触時間５秒で熱処理した。これにより得られた繊維構造体を電子顕微鏡により写真撮影したところ、立設繊維層の表面付近に厚さ５００μｍのスキン層が形成されていた。

（２）　上記（１）で得られた繊維構造体のスキン層の＊表面に２０℃の水道水をスポイトにて滴下したところ、内部に吸収されずに、むしろ水滴をはじく結果となった。かかる点から、繊維構造体の立設繊維層（カットパイル）が捲縮伸長率が５％未満の熱融着性繊維（この比較例３では捲縮伸長率が３％の捲縮していない熱融着性）から形成されていると、立設繊維層の表面を加熱融着した場合の空孔部のないスキン層となることがわかる。

（３）　上記（１）で得られた繊維構造体を１５ｃｍ×１０ｃｍにサイズに裁断し、実施例２の（３）と同様にしてコテ刷毛を作製した。

（４）　上記（３）で作製したコテ刷毛を使用して、上記した方法で光触媒塗料を塗装し、それにより得られた塗装面の親水性（濡れ性）および光触媒性能（アセトアルデヒド分解率）を上記した方法で測定または評価したところ、下記の表２に示すとおりであった。

【００６１】

【表２】

	実施例２	比較例３
・塗装面の性質[1)]		
親水性（濡れ性）	○	×
ｱｾﾄｱﾙﾃﾞﾋﾄﾞ分解率(%)		
３０分後	31	0
２時間後	46	0
２４時間後	91	1

1)光触媒塗料を塗布した塗装面の性質

【００６２】上記の表２の結果からわかるように、地組織の片面に捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成された立設繊維層を有し、且つ該立設繊維層の表面に熱融着性捲縮繊維の融着による厚さ１００～１０００μｍの多孔質スキン層が存在する本発明の塗装具用繊維構造体Ｂは塗料の吸収性能に優れている。そして、該塗装具用繊維構造体Ｂを用いて作製したコテ刷毛などの塗装具は、光触媒塗料などのような粘度の低い塗料を被塗装面に均一に塗装でき、それによって塗装面が良好な光触媒作用を発揮する。

【００６３】

【発明の効果】本発明の塗装具用繊維構造体Ａは、地組織の片面に捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成された立設繊維層（パイル）を有し、該立設繊維層の内側に前記熱融着性捲縮繊維の部分融着により形成された網状融着層が存在し、該網状融着層よりも外側の立設繊維層の表面側にバルキーな嵩高層が存在するという特定の構造を有している。そのため、本発明の塗装具用繊維構造体Ａおよびそれを用いて作製したペイントローラー、コテ刷毛などの塗装具では、該網状融着層が塗料を十分に保持することができ、塗料の吸収性能および保持性能に優れている。そして、網状融着層に多量の塗料を保持することができ、さらに網状融着層の上部にはバルキーな嵩高層が存在しているので、塗料の流出性能および塗布性能にも優れており、液垂れ、塗膜厚みの不均一などを生ずることなく、厚さが均一で、仕上がりの良好な塗膜を円滑に形成することができる。しかも、該網状融着層では、熱融着性捲縮繊維の部分融着によって良好な弾力性を有しているために、塗装する際の塗装具への押圧力のコントロールが容易であり、厚さの均一で、きれいな塗膜を形成することができる。そして、本発明の製造方法により、前記した優れた特性を備える塗装具用繊維構造体Ａを円滑に製造することができる。

【００６４】さらに、本発明の塗装具用繊維構造体Ｂは、地組織の片面に捲縮伸長率が５～３０％の熱融着性捲縮繊維を３０～１００質量％の割合で含む繊維から構成された立設繊維層を有し、該立設繊維層の表面に立設繊維層を構成する熱融着性捲縮繊維の融着による厚さ１００～１０００μｍの多孔質スキン層が存在する。そして、塗装具用繊維構造体Ｂおよびそれを用いて作製したペイントローラーやコテ刷毛などの塗装具では、該多孔質スキン層内に存在する多数の空孔部に塗料微粒子が均

一に保持され、その一方で水などの溶媒は多孔質スキン層を通って内側の捲縮繊維層に良好に保持されるので、本発明の塗装具用繊維構造体Ｂおよびそれを用いてなる塗装具は塗料の保持能に優れている。しかも、塗装時に塗装具用繊維構造体Ｂが押圧されると、立設繊維層の内側に位置する捲縮繊維層に保持されている溶媒が表面に逆流して、表面の多孔質スキン層の空孔部に保持されていた塗料微粒子を被塗装面へと搬送されるので塗料の吐出性能に優れ、それによって被塗装面に仕上がりの良好な均一な塗膜を形成することができる。そのような、本発明の塗装具用繊維構造体Ｂは、本発明の製造方法によって円滑に製造することができる。

【図面の簡単な説明】

【図１】本発明の塗装具用繊維構造体Ａの一例を示す模式図（断面図）である。

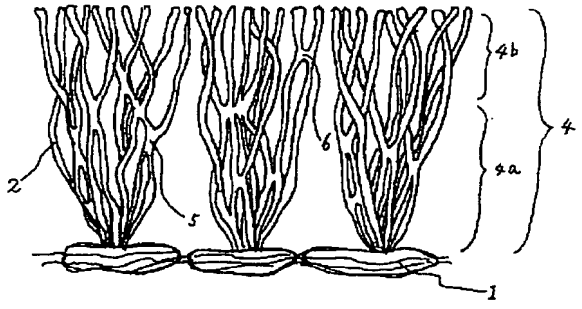
【図２】本発明の塗装具用繊維構造体Ａの別の例を示す＊模式図（断面図）である。

【図３】本発明の塗装具用繊維構造体Ｂの一例を示す模式図（断面図）である。

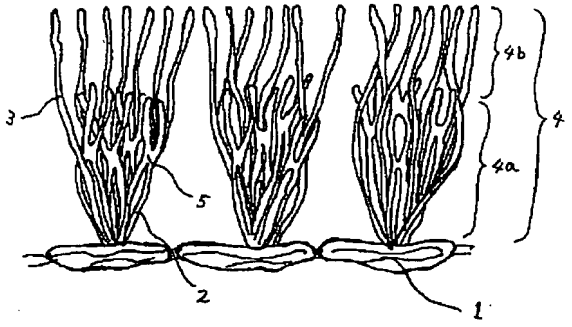
【符号の説明】

１　地組織
２　パイルを構成する熱融着性捲縮繊維
３　パイルを構成する他の繊維
４　パイルから構成される立設繊維層
４ａ　立設繊維層４の内側に存在する網状融着層
４ｂ　網状融着層４ａの外側で立設繊維層４の表面部に存在する嵩高層
４ｃ　多孔質スキン層
４ｄ　非融着繊維層
５　熱融着性捲縮繊維２の融着部
６　熱融着性捲縮繊維２の融着部
７　空孔部

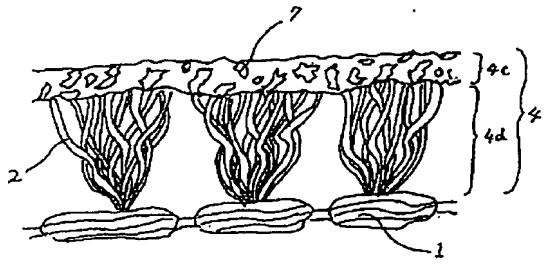
【図１】



【図２】



【図３】



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